Vol. XXVII. Part 3.

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The Journal of the Department of Agriculture of Victoria, Australia.

March, 1929.

PRINCIPAL CONTENTS

Butter Factories in Victoria—Are there Too Many?

Diseases of Stock

Poultry Feeding

Apple Packing

Crop and Fallow Competitions

Standard Herd Test Quarterly Report

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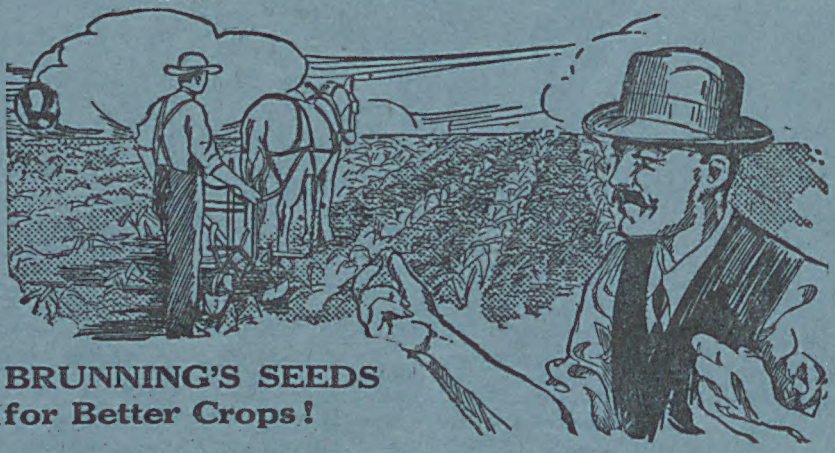

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OF

THE DEPARTMENT OF AGRICULTURE,

VICTORIA, AUSTRALIA.

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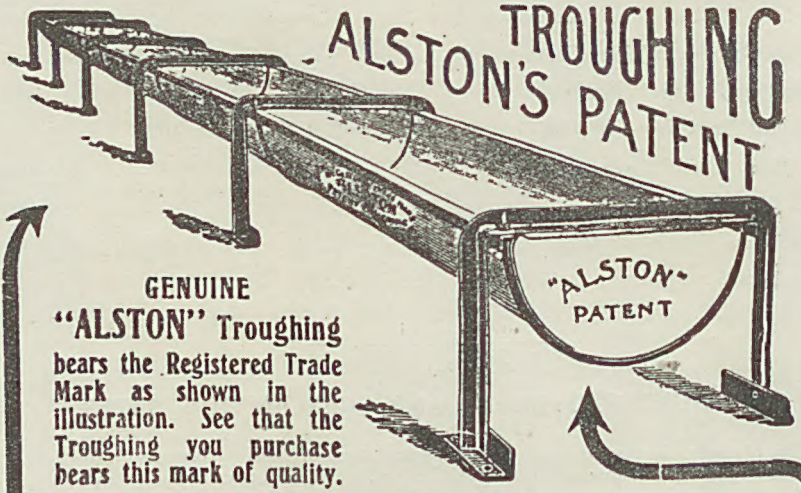

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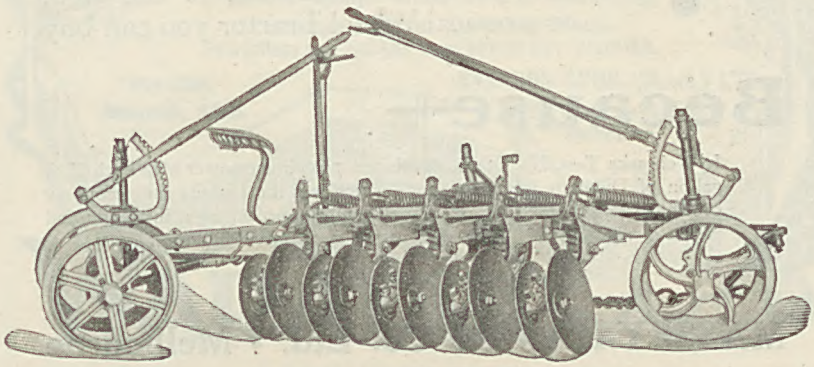

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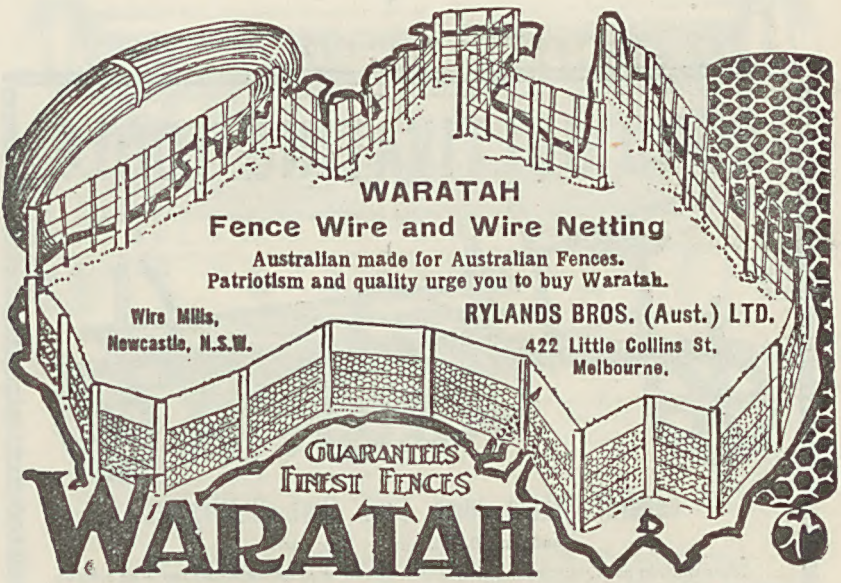

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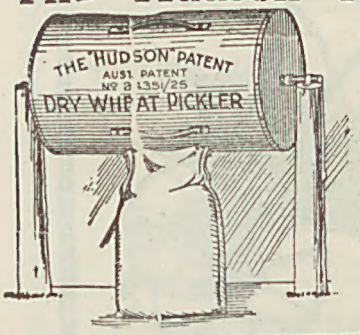

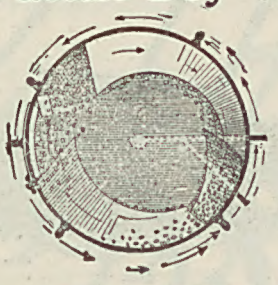

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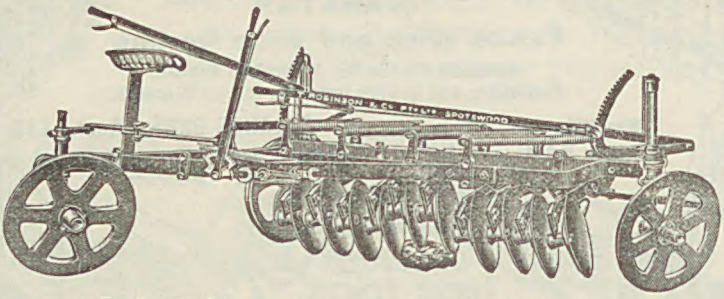

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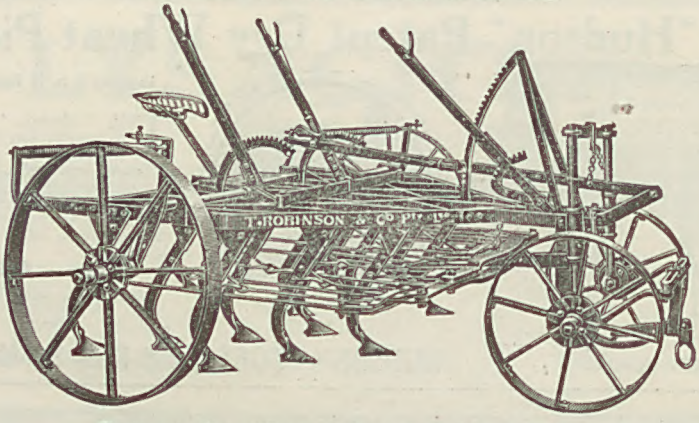

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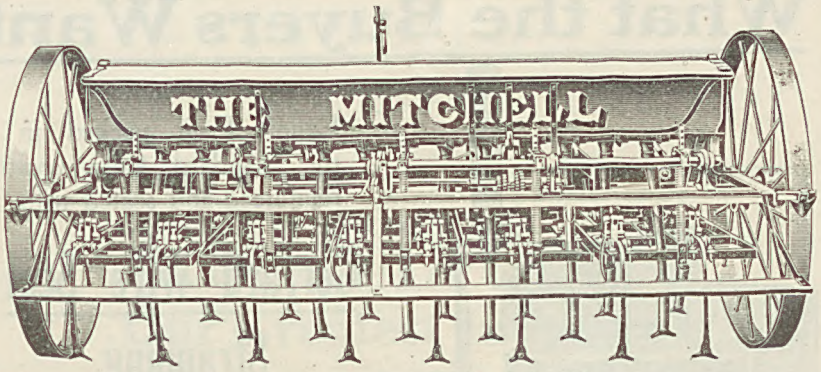

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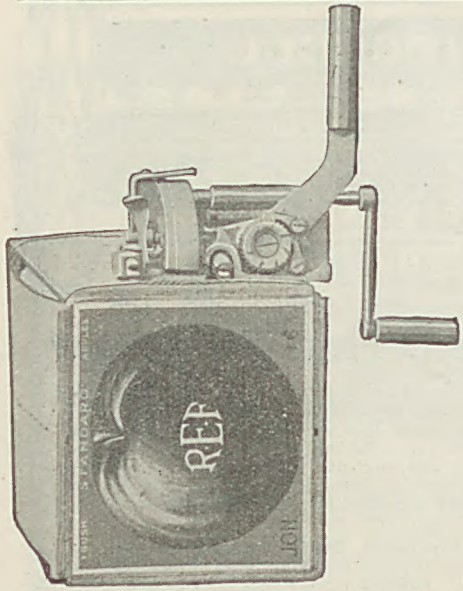

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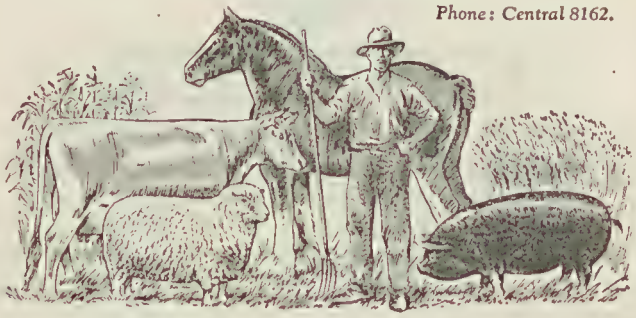

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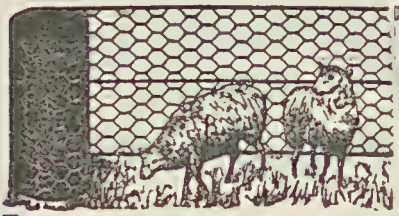

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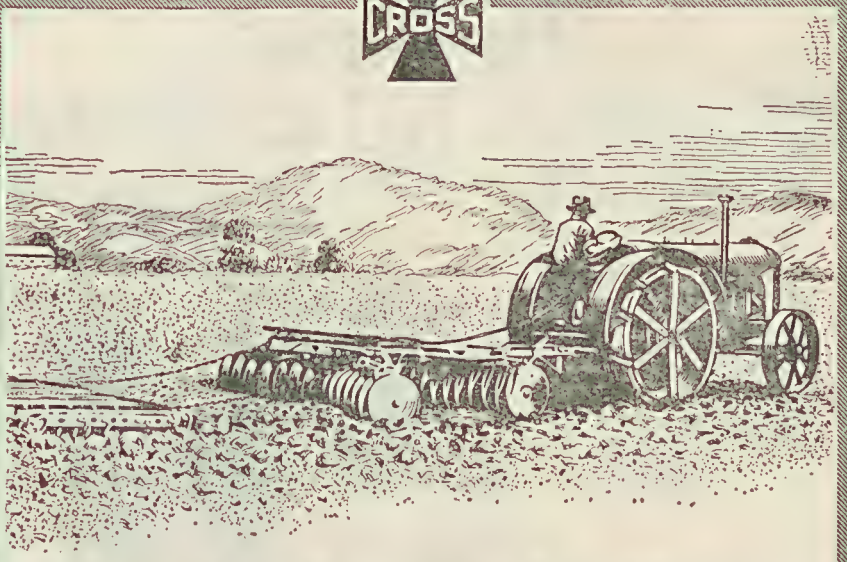

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THE JOURNAL

OF THE

Department of Agriculture

OF

VICTORIA.

Vol. XXVII. March, 1929. Part 3

BUTTER FACTORIES IN VICTORIA.

ARE THERE TOO MANY?

By R. Crowe, Export Superintendent.

In the metropolitan press recently, there appeared an article written by Sir Arthur Duckham, Chairman of the British Economic Mission, and headed "Have Courage to Express Opinions." I have taken this as an invitation to express my opinions on certain comments made in the article, and on some portions of the report prepared by the Mission.

A variety of subjects, all of vital interest to Australia, is dealt with, and as one reads the very concise report, one feels certain that it will supply material for much discussion, and will be a valuable text-book for students of economics.

The object of the Mission's visit was:—

> "To confer with the Commonwealth and State Governments, with the Development and Migration Commission, and the leaders of industry and commerce in Australia on the development of Australian resources and other matters of mutual economic interest to Great Britain and the Commonwealth, which may tend to the promotion of trade between the two countries, and increase settlement in Australia."

Naturally, marketing and distribution received a share of consideration, and are dealt with in the report.

In the press article referred to above, Sir Arthur Duckham states, among other things, that it was not his wish to continue to preach to Australia, but that there were some matters on which he held strong views. There was too much overlapping and division of effort in production. Costs must be cut, and the best way was to reduce overhead expenses. In Queensland, he found there were too many sugar mills; ten could do the job of thirty, and do it with less expense. Then, again, there were too many butter factories carrying on with methods which,

whilst not altogether obsolete, were certainly behind the times. He contended that in production, especially of those commodities with which Australia must compete on the world's market, the outstanding need was to improve the output, and, at the same time, reduce costs.

Many people will not have an opportunity of seeing the Mission's report in full, or of reading Sir Arthur Duckham's press article referred to, which may be regarded as supplementary to the report. Others, reading the report may get quite a wrong impression on the matter of the economic production of butter. It is for this reason that I offer the following comments.

In discussing the Mission's comments, I shall criticize the press article first. The statement that there are too many butter factories operating in this country, coming from such an eminent source, is likely to be interpreted in a way the author did not intend, and carry weight amongst many people who have not a full knowledge of the subject.

It must be acknowledged that in a few places, duplication and overlapping of butter factories do exist, and in such places, no doubt, amalgamation would be in the interests of those engaged in dairying. It is a mistake, however, to suppose such a state of affairs is general; the scope for amalgamation is limited.

Denmark and Victoria—A Comparison.

Denmark is acknowledged as the leading country in the world as far as dairying methods and the manufacture of dairy products are concerned. The State of Victoria is five and a half times the size of Denmark, yet there are nearly ten times as many butter factories in Denmark as in Victoria, notwithstanding that in Denmark there are only twice as many dairy cows. In Victoria, New South Wales, Queensland, and South Australia there are many butter factories much larger than any in Denmark. Generally, the Danish factories have an output comparable with the smaller factories in Australia. One of the highest official Danish authorities, Mr. S. Sorensen, recently visited Australia, and was favorably impressed by our butter factories and methods. An equally good impression was received by Professor Hunziker, who is acknowledged as the leading dairy technologist in America, when he was here eighteen months ago. Many competent Australian authorities who have visited Denmark, New Zealand, America, and other dairying countries have declared that, so far as butter factory management is concerned, we have not much to learn from these countries. It is admitted, however, that there are a few—very few—butter factories whose methods can be described as being behind the times.

The statement made by Sir Arthur Duckham regarding butter factories, sandwiched in as it is with the reference to sugar mills, may convey a meaning as regards numbers which may not have been intended.

The Danes fully appreciate the value of having a butter factory in each small dairying centre. It becomes, in reality, "their own factory." The manager is in close personal touch with the individual dairymen. He helps in the work of education, and is better able to keep them all up to the highest standard. The possession of one's own factory in a district has a real, as well as a sentimental value.

The reason why so much inferior butter is produced in the United States of America is that the cream, in many places, is drawn too great a distance, and the managers are not in close enough touch with the suppliers.

Strange as it may seem, the cost of manufacturing butter is no greater at a number of small factories than at large factories. Indeed, some small factories showing extreme costs for manufacturing, are able to pay suppliers higher prices than the larger factories.

Amalgamation of Factories—Not Always Desirable.

In many cases where the output of several factories is small, an amalgamation might, at first glance, seem desirable. However, if this were done, it might be that additional cost would have to be incurred in the cartage of cream, and possibly there would be delay in having it treated, with a consequent lower percentage of "choicest" grade butter. This would result in lower prices being obtained for the output as a whole, and the additional cost of cartage and deterioration would have to be debited against any saving effected in cost of manufacture. Again, small factories showing very high costs of manufacturing are located, generally, in districts where a large local trade exists. A considerable percentage of the output is put up in prints, and sold direct by the factory to retailers, so that the costs of printing and distribution in such cases come under the heading of "manufacturing." The savings effected by obviating freight and commission enable such factories to pay suppliers higher prices than others not so situated.

Generally, there is a lack of understanding of economics in connexion with the conduct of butter factories. I suppose that nineteen out of every twenty butter factory directors aim at reducing the costs of manufacturing and marketing. This should not be the main objective. The only true basis for comparison is the net price paid to suppliers. I have in mind three butter factories. Any layman would probably regard them as, to some extent, obsolete. Two of them might be considered to be too small for economical results; yet these three factories manufacture the highest grade of butter, and pay suppliers higher prices than any other factories in the State.

Were I a butter factory manager to-morrow, and could see a way in which to manufacture and market butter at even double the average costs for manufacturing and marketing, and, by doing so, could secure another penny, or even a half-penny per lb. higher net return for the producers, I would not hesitate a moment about incurring the additional cost.

The last sentence quoted in the chairman's statement in the press is most significant: "I contend that in production, especially of those commodities with which Australia must compete on the world's market, the outstanding need is to improve output, and, at the same time, reduce costs." Every one must agree with this. To the dairyman, it means the improvement of dairy cows, improvement of pastures, and improvement of methods, so as to secure an increased output of better quality at lower costs. Very many dairymen are aiming in these directions. It is recognized, however, that the growth is necessarily slow. The improvement of herds alone takes many years to accomplish.

Coming to the report of the Mission, under the heading of "Marketing and Distribution," the following appears:—

> "The Australian policy has been in the past to look primarily to the home market, and to export only a surplus, giving the easier home market preference in marketing service. It is not possible to create an export market by this means. Firstly, on account of high costs of production, the attention of producers should be directed to quality rather than quantity. Secondly, an export market should be created on the basis of a demand for Australian goods as such, because of their high grade and constant quality. We find that Australian goods often lose their identity in the British market, and yet Australian butter and fruit are equal to the best from other countries. Thirdly, a constant quantity of goods should be available for the export market. If there is a seasonal decline in output, deliveries should be curtailed to the home rather than to the export market. The higher price obtained on the home market, due to the stronger demand, would go towards compensating producers for the smaller output. Fourthly, if there is a seasonal glut, care should be taken to maintain the standard of quality, and any surplus of lower grade should be sold as such, and preferably, not marketed as Australian goods."

No one in Australia is likely to agree with the principle indicated in that portion of the statement referring to a constant quantity of goods being available for the export market. The local market will continue to be fully supplied, as it has been in the past, and it is only the surplus that will be exported, regardless of every other consideration.

Were it not for another paragraph in the report, the reader would naturally conclude that the Mission was more concerned about the British market than Australian interests. In this paragraph it is stated—

> "At the same time, there are markets nearer Australia, and we recommend that their exploitation should be undertaken by the best men available under the instructions of the organizations of the industries concerned."

With reference to the suggestion for the disposal of any surplus of lower grade, it may be pointed out that the law in Great Britain makes it obligatory to have all goods branded with the country of origin. While such a law exists, and it is likely to continue, it is difficult to see how any surplus of lower grade goods exported from Australia can be marketed in any other way than as Australian goods.

It should be noted that the Mission's report on these matters, which I have quoted, are general, and apply to the whole of Australia. Likewise, my remarks, though dealing chiefly with Victoria, are applicable to Australia generally.

Anything I have said is not offered by way of criticism—or at any rate carping criticism—but rather with a view to supplement that part of the report dealing with an industry with which I am closely associated, so that those interested will be better able to consider the valuable advice given to Australia by the British Economic Mission.

POULTRY FEEDING.

THE USE OF AUTOMATIC HOPPERS.

W. C. Rugg, Chief Poultry Expert.

The Free Choice System.

The free choice system of feeding pullets has been thoroughly tested at the Werribee Research Farm for five years, and has given very satisfactory results. It has proved to be labour-saving, economical in cost of food, and the birds have consistently laid profitable numbers of

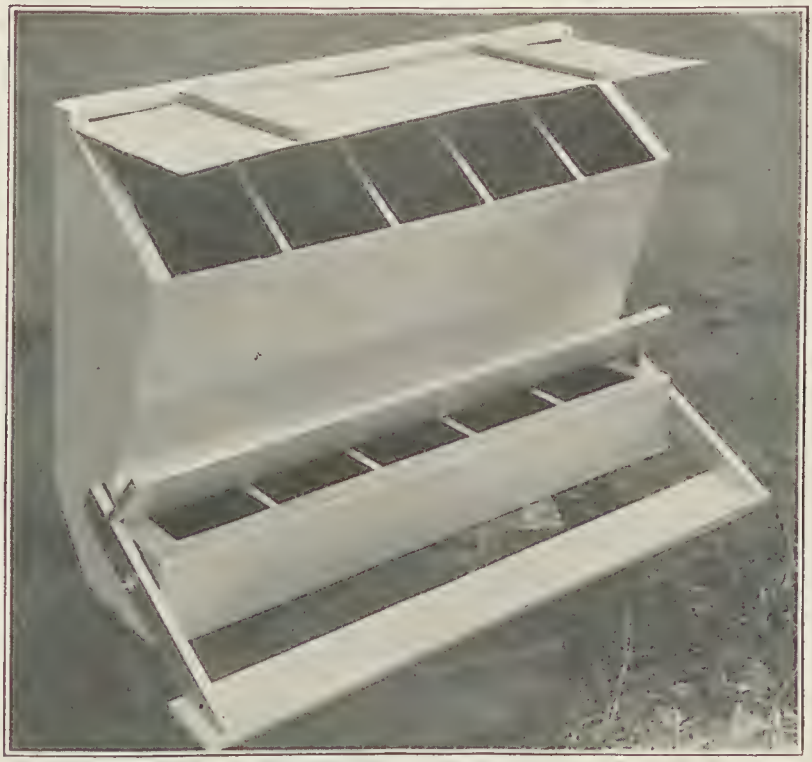

Fig. 1.—Hopper used at Burnley for Free Choice Feeding.

eggs. The breeds experimented with were Black Orpingtons and White Leghorns, and at no time have any birds shown a tendency to become overfat. At all times they were in excellent health, and came through the moult evenly and rapidly, and in excellent condition for breeding purposes during the succeeding season.

Under the free choice system the several varieties of food are placed in different hoppers, and they are available to the birds at all times.

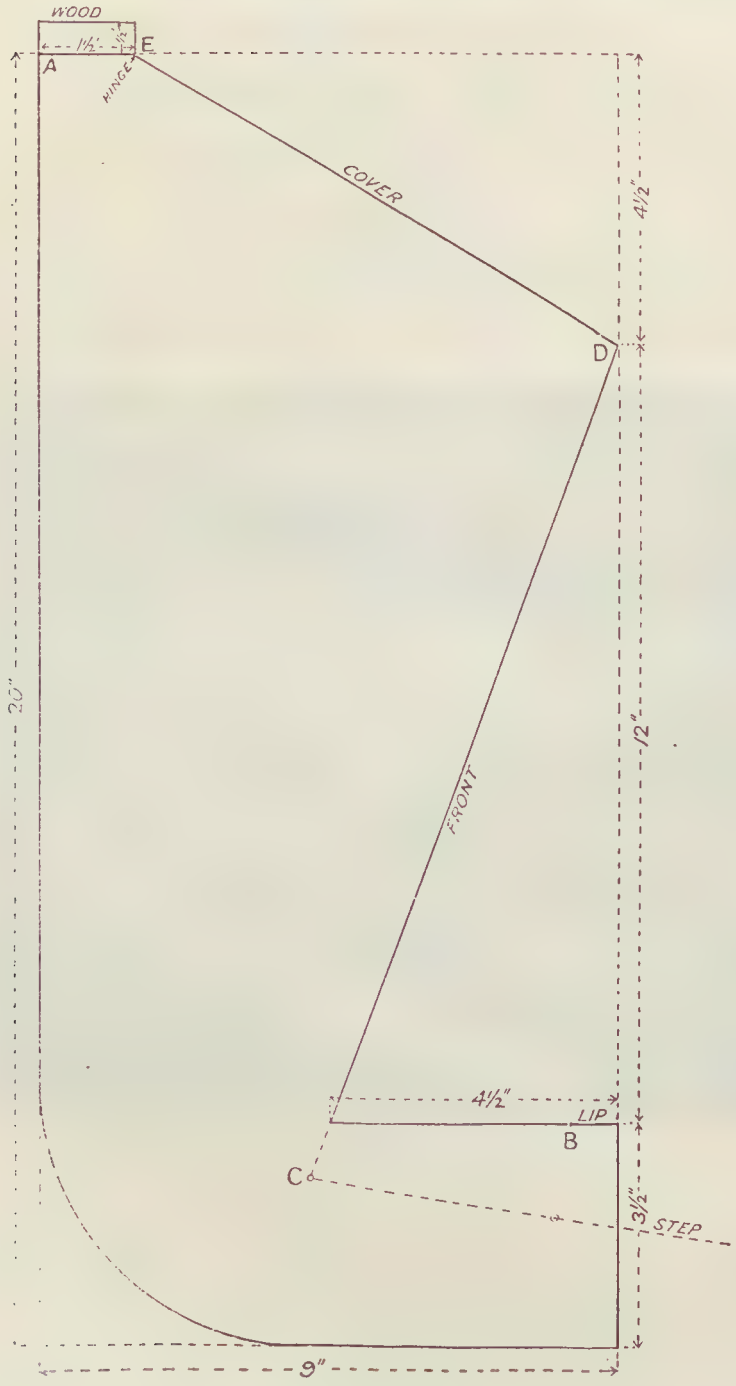

Fig. 2.—End of Hopper shown in Fig. 1.

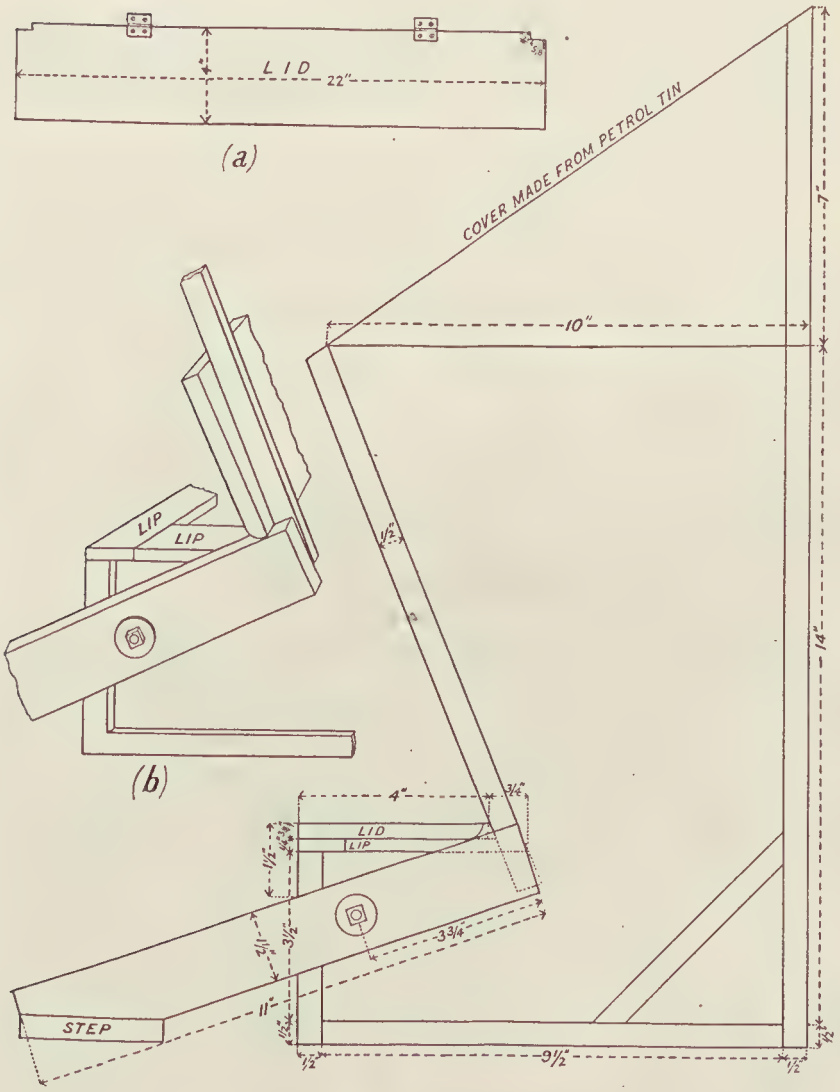

Fig. 3.—Plan of Automatic Hopper.
(*a*) Lid. (*b*) Step.

Each variety can be weighed, and the actual consumption recorded from month to month. Foodstuffs can be chosen from:—

Meals.—Bran, wheat pollard, oat pollard, maize meal, dried buttermilk, meat meal.

Grains.—Wheat, oats, maize, barley.

Constant supplies of succulent greenstuff are essential. It should not be chaffed, and if it is placed in a wire-netting basket the birds will pick it out as they require it. Shell grit and charcoal should also be provided.

Dry Mash Feeding.

There are many mixtures fed to fowls as dry mash. Some ready for immediate use are sold by various poultry food suppliers. The following has been found to give satisfactory results:—Bran 12 lb., wheat pollard 20 lb., oat pollard 4 lb., meat meal or dried buttermilk 3½ lb.

It should be available to the birds at all times. In addition, a grain ration made up of wheat three parts, oats and maize one part each, must be given every afternoon. Greenstuff should be fed at mid-day and after the grain. In the winter it should consist of mustard, rape, prairie grass, rye grass, or milk thistles, and in summer time it may be any of the following:—Lucerne, silver beet, lettuce, cauliflower, and cabbage leaves, or green maize.

How to Make a Hopper.

The hoppers in use at Burnley Egg-laying Competitions are very simple to make. An illustration of one appears on page 133, Fig. 1. Fig. 2 shows the shape of the end of the hopper. The two ends are made of wood, and the remainder consists of three pieces of plain iron. One piece covers the back, bottom, and front of the feed-trough from A to B; the second piece covers the front from C to D; and the third forms the cover from D to E, and is hinged on the top to a small piece of 1½-in. x ½-in. timber. This hopper is usually about 20 inches long, but can be made any length, and can be partitioned off if required. The automatic step can be attached as shown in Fig. 3. The first time I saw this step was at the farm of Mr. R. Lewis, Sebastopol, near Ballarat.

A very simple hopper can also be made from kerosene or petrol cases. The plan on page — indicates the method of construction. The main part of the hopper is made from one case; the top section consists of a quarter of a case, cut on the angle so that the birds cannot roost on it.

It may be hung on the wall about 2 feet from the ground, and when the fowls jump on to the step the lid of the feeding trough will open.

A narrow lip about 1 inch wide is placed round the feeding trough to lessen the wastage of feed. An endeavour should always be made to construct the hoppers in such a way that waste of food will be reduced to a minimum. If some kind of automatic lid to the feed box is not provided, sparrows in the day time and mice and rats at night will eat large quantities of the feed.

COMMON AILMENTS OF STOCK.

By R. N. Johnstone, B.V.Sc., Veterinary Officer.

In discussing such a wide subject as "The Common Ailments of Stock" it is difficult to know where to begin, and also to know on which of the many phases of the subject one should concentrate.

The factors necessary for success in treatment of ailments of live stock are careful nursing and plain common sense. Where an animal is suffering from a flesh wound or from lameness or any such trouble the owner should try to reason out what treatment he would be likely to give himself if similarly afflicted, and as far as circumstances will permit, he should give the animal like attention.

Strained Tendon of Horse.

Take, for example, a horse with a strained tendon; by that I mean a strain of one of the tendons running down the back of the leg from the knee or hock to the pastern. Now, let any person affected with a similar injury above his heel, unable to lie down and rest, but compelled to keep upright and moving, ask himself what position would afford him most ease. In all probability he would walk on his toes, or the ball of his foot, thus keeping the strained tendon slack and preventing the recurrent strain brought about by placing the heel on the ground with each step. For, remember, when a tendon or muscle is strained the injured portion swells, the whole structure shortens, and a position that is quite normal for an uninjured foot will cause a great amount of pain when the back tendon is shortened and becomes sensitive.

Apart from structural differences, the main variation between man and the rest of the animal world is that man has the power or gift of reason. Because of that lack the horse fails to realize that the act of placing his heel on the ground is the cause of each successive stab of pain; therefore, it becomes part of the owner's duty, as nurse, to put something under that heel, which will prevent the animal from placing it on the ground, thus securing the best of all treatments—rest for the injured part.

It can be secured at once by placing a triangular piece of wood from 1½ to 2 inches deep under the heel and fixing it in that position by means of a bandage. This, of course, is only a temporary measure. For a permanent fixture, get a special iron shoe made by a shoeing-smith. This shoe should be made so that the ends will project several inches. These ends should be turned down sharply at the point of the heel; each end is given a complete half turn so that they meet each other under the heel, and they should then be welded. The distance from the foot level to this bar is about 2 inches. When nailed to the hoof this forms a permanent stilt which will allow the toe to come to the ground, but will keep the heel raised about 2 inches, and thus prevent the tendon from undergoing further strain when walking.

This shoe must be kept on the foot until all heat and swelling have gone from the tendon, and the heel should then be lowered gradually by reducing the height of the stilt, not more than half an inch at a

time, with at least a fortnight between operations. If at any time during this process the tendon again becomes tender, replace the higher stilt for a further period. During the whole time of treatment the tendon should be gently massaged; a liniment may be used, or the cold water treatment adopted, or, if preferred, cooling lotions may be applied.

In all cases, if the horse is valuable, it is advisable to consult a veterinary surgeon who will determine, after examination, the form of treatment that is desirable.

Nail in the Foot.

Another form of lameness very common in horses is caused by a nail or other hard sharp object penetrating the sole of the foot and the wound becoming infected. Pus or matter forms between the sensitive and the horny sole and causes very acute pain.

This abscess formation sometimes follows a bruised sole or a corn. Any person who has suffered from a festered nail on a finger or toe can realize the acute pain which results and can sympathize with the horse. The place of injury is sometimes difficult to find, and one may determine the exact site of the lesion only by tapping the sole gently with a hammer, or pinching it with an open-mouth pair of pincers. Those who have experienced a festered nail know the relief that follows when the abscess is opened and the pus is allowed to escape, and will appreciate the necessity of giving similar treatment to the horse at the earliest possible moment.

The difficulty lying in the way is the dense, thick, horny sole which must be pared away. A farrier's foot knife is the implement most suitable for this operation, and care should be taken that the instrument is sharp before operations are commenced. Pare the sole away gradually over a large area using the flat face of the knife. In this way the sole is thinned down for a considerable distance around the abscess. Before the abscess is opened the surrounding sole should flex easily when pressed with the ball of the thumb. The abscess should then be opened and all under-run portions of the sole cut away. Sometimes when this is complete it will be found advisable to further thin down the surrounding edge of sole. If this edge is too thick or strong the protrusion of the sensitive sole will seal the opening; further, pus formation will occur and recovery will be delayed. After the abscess has been thoroughly opened up, the exposed soft tissue should be treated with an antiseptic dressing, such as 5 per cent. solution of lysol. An antiseptic ointment should be applied, and the sole packed with tow or lint, and bandaged in such a way as to prevent dirt gaining access to the exposed surface.

Wounds in Horses.

Because of their work and mode of life horses are frequently subject to wounds and abrasions of various sorts. To discuss in detail the forms of treatment necessary for the various wounds would be beyond the scope of these notes, and, therefore, I must confine my observations to those having a direct bearing on the practical side only. Wounds are divided into (*a*) incised, (*b*) punctured, (*c*) lacerated, and (*d*) contused.

(*a*) Incised wounds are seen in surgical operations or are accidentally made by some sharp object, and in those cases the edges being clean-cut with little or no damage to the surrounding tissue, healing will take place quickly, unless, of course, there is pronounced septic contamination.

(*b*) Punctured wounds are those in which the skin injury is out of all proportion to the depth of penetration. All experienced practitioners know how dangerous these wounds are. To the layman the seat of puncture may be so small as to escape his notice altogether, or if detected, its apparent insignificance causes no fear, with the result that expert aid is probably not called in until grave septic lesions have set in, seriously endangering the life of the animal. It is probable that there is greater loss of animal life by punctured wounds than by any other type of injury. All punctured wounds must therefore be looked upon as a serious menace to life from the outset and treated as such.

(*c*) Lacerated wounds are those showing irregular edges, with laceration or tearing of the deeper structures. They are usually caused by blunt objects coupled with considerable impact, as is obtained, for example, in collisions.

(*d*) Contused wounds are those in which there is a considerable degree of blood extravasation or effusion of serum in and around the injured area. They are usually the result of collisions or kicks.

In practice, if one excludes surgical wounds, nearly every abrasion seen is infected at the time of injury or soon after, but, fortunately, the majority of animals possess a high degree of immunity, so that, except in punctured wounds, the infection remains local throughout with, as a rule, small danger to life.

If the wound is recent and bleeding, the severed blood vessels should be picked up with a forceps and twisted, or, if large, ligatured. All clotted blood should then be removed, for it must be remembered coagulated blood is an excellent medium for bacterial growth. If the tissues are badly torn, it may be necessary to effect a surgical removal of certain portions, so as not to leave dying tissues where they may eventually undergo putrefaction, delay healing, and, perhaps, endanger life through septic infection. When the wound has been neglected at the outset, is suppurating profusely, and has deep-seated pockets containing dead tissue and pus, the free use of the knife and the provision of ample draining is imperative. Punctured wounds must be opened freely so as to allow them to drain. In many of these cases a considerable amount of courage is required to convert a small, apparently innocent, wound into a large gaping one, but, nevertheless, it is the only way in which the injury can be successfully treated.

In all cases where the possibility of lodgment of foreign bodies exists, these must be sought for by the finger, or a probe, and their removal effected. These measures completed, the cavity is treated with antiseptic, and if the wound is gaping, the edges may be drawn together with stitches. When inserting stitches one must be careful to place them in such a position that drainage is in no way interfered with. Subsequent treatment may be by chemical agents or by injections of special serum or other biological products.

A large variety of chemical agents are now used in the treatment of wounds, the tendency being to select those which have a high germicidal power, while at the same time not interfering with the healing processes of the tissues to which these are applied. Dressings may be applied in the form of a watery or alcoholic solution, or combined with oil, or as a dry dressing powder, depending to some extent on the type of wound undergoing treatment. Amongst the agents used I may mention lysol in a 5 per cent. solution; peroxide of hydrogen, one part to four of water; this is particularly useful in the treatment of deep wounds, especially where the danger of contamination with stable manure exists, because the organism which causes lock-jaw abounds in stable manure. It is interesting to know that the large number of cases of lock-jaw which, at one time, occurred annually amongst men in the United States of America, following on the fourth of July celebrations, were greatly reduced when the use of peroxide of hydrogen as a dressing of wounds was adopted.

The organisms will live only in situations where no oxygen exists, and, therefore, the oxygen given off by this dressing is fatal to them. Tincture of iodine also makes an excellent dressing for wounds. Amongst dry dressings boric acid and zinc oxide may be mentioned. These two drugs, in equal quantities, combined with an equal amount of tannic acid, make an excellent dusting powder for open wounds.

The application of the various serums and biological products should be used only under advice from a qualified veterinary surgeon, whose training enables him to determine when their use is advisable or necessary.

Blackleg in Cattle.

During the past six months a very large number of inquiries have reached the Department of Agriculture regarding blackleg in cattle, which seems this year to be very prevalent. Blackleg is an acute infectious disease of young cattle, in the course of which swellings occur in the muscles of certain regions of the body; a large amount of gas forms in these swellings, and locates itself underneath the skin. On rubbing one's hand over this surface a crackling sound is heard, which resembles the crackling of a very dry newspaper. Occasionally the muscle lesions are so deep seated that the gas does not reach the surface. The swollen muscle is always very black in appearance, and is distended by bubbles of gas. Fever is present in the affected animal before death.

The disease is caused by a specific bacillus, which persists for considerable periods in soils contaminated by the carcasses of animals that have died of the disease. As a rule, it affects only cattle up to four years of age; very rarely do cattle of a greater age develop the disease. Sucking calves are attacked only in exceptional cases. The period of incubation of the disease is from three to five days. At first the animal shows a rise in temperature and then stops eating; then it develops lameness or a stiff dragging of one leg. In a short time the characteristic blackleg swelling may appear, particularly in portions of the body covered with thick muscles, such as the shoulder, the loin, or the buttocks; this swelling is irregular in shape, is hot and painful, and

develops rapidly; later it becomes cold and insensitive in the centre, and may be cut open without causing any pain to the animal. On pressing the swelling the peculiar crackling noise mentioned before may be heard. In the meantime breathing becomes rapid, the heart-beat is quickened, and occasionally attacks of colic occur. At last the animal lies on the ground stretched out motionless, the temperature drops below normal, then rises again, and death occurs immediately. The disease lasts from a half to four days; in a very few cases it may last longer. Recovery is so rare as to be almost unknown. Carcasses of animals that have died of the disease should be at once destroyed by fire if possible. The disease seems to be limited to certain regions and to certain places. In those regions all young cattle should be kept away from any damp, swampy pastures; better still, the swamps should be thoroughly drained and exposed to sunlight.

Animals may be protected against blackleg by vaccination with a specially prepared vaccine. The first vaccine used was made from dried powdered affected muscle which had been subjected to heat, but at present most vaccines are prepared from cultures of the organism, which are treated in such a manner that while they will set up an immunity they will not cause the disease in susceptible animals. Owners of cattle, on infected farms, should vaccinate all cattle of susceptible age at frequent periods. Fourteen days after successful vaccination the animal is immune, and this immunity should last for at least twelve months.

BLACK DISEASE IN SHEEP IN AUSTRALIA.

By W. D. Shew, B.V.Sc., Veterinary Officer.

For over 60 years sheep-breeders in the south-eastern portions of Australia, and also in Tasmania and New Zealand have suffered enormous losses from a disease, the cause of which, until quite recently, was unknown. For a long while no name was definitely decided on for this trouble. In some quarters, owing to its similarity to that dread sheep disease of Northern Europe, called by the English name of "Braxy," or the Danish term "Bradsot," it was referred to as the "Braxy-like disease of Australian sheep." At the same time, it was observed that although clinically this Australian trouble was similar to Braxy, the post-mortem appearances were unlike, and it was realized that the causes of the two diseases were different.

Scientific investigations were made in connexion with this problem from time to time in Australia, but these efforts were fruitless until 1914. Between the years 1914 and 1926 the late Dr. Dodd, of the Sydney Veterinary School, carried out the first complete clinical and bacteriological studies of the disease. In 1921 he described an anaerobic microbe which he then considered to be the cause of the trouble, and in the same year Mr. Albiston, of the Melbourne Veterinary Research Institute, isolated the microbe, a thorough study of which has been made.

The disease has since been studied with marked success by Mr. A. W. Turner, of the Melbourne Veterinary School, who has declared the causal organism to be the *bacillus oedemetiens.*

This disease varies according to climatic conditions. In New South Wales the greatest mortality occurs between the end of summer and the end of autumn; in Victoria, from autumn to the end of the winter rains.

Young animals seem to have a greater resistance to the infection than older ones. It has been noted by Albiston, in Victoria, that only animals more than fifteen months old contract the disease. Dodd, however, in New South Wales noticed it in animals from six to twelve months old. Sex apparently plays no part in the frequency of infection.

It is hard to form an estimate of the amount of loss incurred by the disease. This difficulty is increased by the disinclination of many owners to report mortalities for fear of their properties developing a sinister reputation, and also owing to the wide expanse of many sheep-carrying lands.

In 1918, Cleland estimated the loss at over £100,000 per annum, and sheep are dearer now than they were then. On one property in New South Wales, there were over 3,000 deaths from black disease over quite a short period. At any rate, it can be said that the mortality varies, and has been as heavy as 25 per cent.

Symptoms.

A sheep affected with black disease shows few, if any, symptoms. Death usually occurs during the night.

To discover affected animals, it is necesary to drive the flock about with dogs; ailing sheep, unable to keep up with the others, will soon begin to drop out. If urged on, they lie down, but not on one side as do healthy sheep; they appear to be sitting up on the breast bone with the front legs folded under the chest.

A sheep suffering from black disease is utterly listless; if struck with a stick, it appears quite indifferent, and makes no effort to get out of the way of its attacker. It will allow itself to be pulled about in any manner without a struggle. The breath comes in gasps. Death usually follows in about fifteen minutes after the animal has lain down, but now and again an animal may last an hour. The temperature varies; in some cases it is found to be very high. Generally the carcass remains in the position into which the sheep threw itself on lying down; rarely are there any signs of its having writhed in pain, as is the case with most animals dying from an infectious disease.

When holding post-mortem examinations, it will be found that sheep which have died from black disease are usually the best woolled and most flourishing of the flock.

In the tissues beneath the skin of the abdomen a jelly-like fluid is found, rosy in colour, which rapidly becomes blackish, and the blood vessels are very congested.

The abdominal cavity shows an excess of fluid, and the spleen and kidneys are congested. The lung wall of the fourth stomach is inflamed, especially near the pylorus, i.e., near the entrance to the intestines. This is sometimes blood stained, but otherwise the intestines are normal. The bladder appears healthy, and the urine is normal in quantity and in colour.

The most striking changes are found in the liver, which is enlarged, dark red, and congested. It has fibrinous areas showing recent invasion by liver flukes. These areas or patches are irregularly circular in shape, sharply defined, and greyish-white or dirty yellow in colour. These necrotic patches vary in number, and are from about half an inch to over 1 inch in diameter, and are usually found on the side of the liver nearest the diaphragm. They are fairly firm in consistence, and in a fresh case have no odour. They are surrounded by a dark zone of congestion which is most pronounced on cutting into the liver substance. They extend to a variable depth into the liver, usually to a depth of about one-half of their surface diameter. Other necrotic areas may also be found in the substance of the liver, which do not show on the surface. It is therefore always essential to slice the liver into strips, and examine the cut surface. It is also important to look for the presence of immature liver flukes in the substance of the liver, for these are always present in a case of black disease; they are from about $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in length.

On opening the chest cavity, one is immediately struck by the distension of the pericardial sac—that is the sac or bag which contains the heart. This sac is full of a yellowish liquid which soon clots, or is already clotted into a yellow jelly.

In outbreaks of black disease, owners have often reported having found a bag of jelly round the heart. Bright red spots are found on the heart, and the amount of fluid present varies in quantity.

The lungs are normal, but there is nearly always a certain amount of fluid in the thorax or chest cavity.

The striking absence of lesions is characteristic of this malady, the most marked, as already mentioned, being the necrotic patches on and in the liver, and the sac of yellow fluid or jelly round the heart.

Post-mortem examinations must be made soon after death, as the carcasses rapidly decompose and become black, and soon the wool is easily pulled out.

As already stated, the microbe which causes this deadly disease has been found to be the *bacillus oedematiens*, the tiny germ which was found to be one of the causes of gas gangrene in soldiers during the Great War. It is an anaerobe, that is, it grows in the absence of air. It is found in the soil, and is probably present in a certain percentage of sheep on affected pastures, but only those which have been recently attacked by young liver fluke contract the disease.

In all probability the reason for this is that wounding of the liver by fluke allows the germ to gain a footing, and so causes necrotic hepatitis (necrosis of the liver), which is now recognized as black disease of Australian sheep.

Post-mortem examinations of sheep that have died from black disease have revealed in every case the presence of immature fluke in the liver. It is therefore probable that black disease rarely, if ever, exists without liver fluke, and to prevent the malady the eradication of liver fluke is essential. This can best be carried out by the broadcasting of copper sulhpate (bluestone), as described in the article on "Liver Fluke Disease," see page 146.

Messrs. Albiston, Turner, and Murnane are carrying out numerous vaccination tests and further investigations into the control of this disease, and are meeting with marked success. I would like to thank these three gentlemen for much assistance in the compilation of these notes.

LIVER FLUKE DISEASE.

By W. D. Shew, B.V.Sc., Veterinary Officer.

Liver fluke disease is one of the most serious sheep diseases in Australia. In addition to the actual mortality from the disease, the deterioration in wool and mutton value of those animals which survive attacks must be taken into consideration. Further, "flukey" sheep are much more liable to infection with other parasites, such as lung, stomach, and intestinal worms.

The areas in Australia in which fluke is most prevalent are those having a comparatively heavy rainfall, such as high undulating country, the tablelands, and the flat coastal or lake country, as well as the irrigation districts. In Victoria, it has been found that the North-Eastern and Goulburn Valley Districts are especially prone to this trouble, and it is also common in Gippsland and in the Western and Central Districts. In the same way, in each of the other States there are certain areas where losses are particularly severe.

Cause.

Liver fluke disease is caused by the presence of a flat, bag-like, somewhat oval worm, the liver fluke (*Fasciola hepaticum*), in the bile ducts and liver substance of sheep. Cattle may also become affected, but not to anything like the same extent as sheep.

It is essential that one should understand the life cycle of the worm, in order that one may appreciate how flocks become infected, and how the disease may be prevented, or, if the sheep and pastures are already attacked by the worm, how it may be eradicated.

The adult fluke is a flat, greyish-yellowish, or greenish-brown worm, somewhat like a small leaf, about 1 inch long by ½ inch wide. They may be found in large numbers in the bile ducts of affected sheep where they lay their eggs, each one possibly laying many thousands. They are minute, brownish-yellow in colour, egg-like in shape. They may be seen by smearing bile from the ducts on a piece of glass, and holding this up to the light. From the liver the eggs pass into the bowels, and so, with the faeces, are deposited on the pastures. The eggs will not hatch unless they soon come in contact with water or moisture, in which case they will hatch out, if the weather be warm, in about eleven days, but under cooler conditions they will require a longer period. In the process of hatching, a cap on the egg is lifted, and a minute embryo emerges.

This microscopic fluke swims about by means of fine hairs with which it is covered, but will live only for a few hours unless it finds a certain variety of small fresh-water snail, which is essential to its further development. This snail will be described later. On finding this snail, the tiny fluke bores its way in, and undergoes a complicated course of development. Some few months later, growth within the snail is completed, and for each tiny fluke which entered the snail, some hundred or more young ones may emerge. These young flukes, still microscopic in size, are heart-shaped, and have long tails.

For a short time they swim about in water, and then attach themselves to weeds or blades of grass. Their tails disappear, and a secretion is thrown off, forming a protective cyst-wall around them. These encysted forms are now ready to infest sheep, and the only way in which sheep can become infested is by drinking water containing flukes, or by grazing on affected pastures.

In the sheep, the cyst-wall is dissolved by the digestive juices, the tiny fluke bores through the bowel-wall, and falls into the abdominal cavity, i.e., outside the bowel-wall, where, in a few days, it increases in size, and when about one-eighth of an inch in length, and resembling an adult fluke in appearance, it attacks the liver, bores its way in, and so through the liver substance, and making its way to the bile ducts, completes its life history. It becomes mature in the bile ducts, and about two months later will lay thousands of eggs.

Symptoms.

Affected sheep, if driven, will be noticed to be languid and easily fatigued. If examined, the membranes of eyes and mouth will be seen to be anaemic. Later their gait may become stiff; they will lose condition rather rapidly, and dropsical swellings may develop under jaws, chest, and along the abdomen. Death may take place within two or three months, or the animals may apparently recover, but even in these cases the interference with growth and loss of condition is very serious. The carcass of a sheep which has died from fluke disease will be emaciated, generally there will be fluid in the abdominal cavity, whilst the liver will be found to be much altered, the bile ducts thick and distended, and on opening these, large numbers of fluke will be revealed. Fluke may live in the bile ducts for twelve months or more.

Treatment.

Treatment of this disease proved unsatisfactory until 1926. In that year, R. F. Montgomerie, B.Sc., P.H.D., F.R.C.V.S., working in Wales, found that one dose of carbon tetrachloride was definitely effective in destroying all adult flukes in an infested sheep. Carbon tetrachloride is a heavy colourless liquid with a characteristic odour, and is very volatile, that is, it will evaporate quickly. The cost of this drug is small, and it can be easily administered. For each sheep, the dose is one cubic centimetre, or about sixteen drops. This is a perfectly safe dose, and is quite effective in destroying all adult fluke.

There are two methods of administering the dose in regular use:—(1) The liquid method; (2) the capsule method.

If using the liquid method, one must first dilute the drug with liquid paraffin so as to make a larger bulk, which can be easily given through the mouth with a syringe. To prepare the mixture add 4 pints of liquid paraffin, an oily colourless liquid, to 1 pint of carbon tetrachloride. For one dose, 1 c.c. of carbon tetrachloride is required, to which must be added 4 c.c. of liquid paraffin, making a total dose of 5 c.c. A special 5 c.c. syringe, with a metal nozzle, suitable for administering this dose, may be purchased. If desired, the mixture can be purchased ready for use.

Any druggist will supply the drug, the paraffin, and the syringe. One quart of carbon tetrachloride and 4 quarts of liquid paraffin will be sufficient to drench every 1,000 sheep. Only sufficient for immediate use should be prepared. When a mixture ready for use is being used, it must be kept securely corked, for the drug is so volatile that much of its strength may be lost by evaporation if exposed to the air.

The capsules are like small lozenges, and can be purchased from any chemist or drug store, filled ready for use. In some ways this method is to be preferred, as the dose does not have to be measured, and there is no loss by evaporation. However, there are certain drawbacks to capsules, for if they are crushed by the teeth, trouble may ensue. Further, it may happen that, in some cases, they may not be swallowed, and may drop from the mouth unseen by the operator. The capsules may be given by means of a small balling gum or tube which can be made out of a piece of hose about 10 inches long, with a diameter of half an inch; insert into this a piece of wood or cane not quite the length of the tube, so as not to injure the sheep's throat. A pair of tongs made out of fencing wire is used by some owners to drop the capsules at the back of the tongue.

The price of the capsules is about 10s. per hundred, while by using the liquid method, the cost will be about 6d. per 25 sheep.

The best time to dose the sheep is about the end of May, when the flukes have mostly reached their adult stage, and are in the bile ducts. One dose should be effective; but with a view to catching any which, at the time of the first dose, had not reached the ducts, it is advisable to give a second some six weeks later, i.e., about the beginning of July.

Such treatment, properly carried out, will eradicate the adult fluke from infested sheep, but it will not clear up fluke-infested country. This can be done only if proper measures are sytematically carried out. The first essential is the removal of the small conical fresh water snail already referred to. This snail has a small greenish-brown conical shell about a quarter of an inch long. When placed with the open end of the shell downwards, it will be noticed that the spiral or curl of the shell turns to the right (*Limnea brazieri*). This is the only snail that as yet is definitely known to be the carrier of fluke disease in Australia. By destroying it, we can definitely remove the menace of the disease, for the presence of the snail is essential for the completion of the life cycle of all fluke.

It has been found that by the systematic use of copper sulphate (or bluestone) the snail can be destroyed. This is best carried out by the regular broadcasting of finely powdered bluestone mixed with four parts of fine sand.

Take, say, 25 lb. of fresh bluestone crystals, and by the use of a hammer, followed by a small hand-grinding machine, crush them into a fine flour-like powder. Probably half a day would be required to do this job properly. Mix this 25 lb. of fine powder with 100 lb. of sand, thus making 125 lb. of mixture, which is sufficient to thoroughly treat 1 acre of snail infested pasture. In actual use, one only sprinkles the powder around swampy areas, around the edges of pools, dams, &c., that is, wherever there is moisture, and consequently where snails are likely to congregate. The faintest trace of bluestone, even one part in a million, will destroy them. In addition to broadcasting this mixture, it is advisable to hang small bags of bluestone on sticks in all dams, ponds, streams, &c., to which sheep may have access.

The broadcasting should be carried out from October onwards, as the principal escape of young fluke from snails takes place from then till late in summer. It should be noted that this treatment will not injure sheep or any other animals in any way. One treatment with bluestone is not necessarily sufficient, as its efficiency is lost after about one week; therefore it is well to repeat the sprinklings from time to time.

The fluke snail has two egg hatchings annually, one in December and the other in July. The eggs are deposited in jelly-like masses about half an inch in length, each mass containing about 40 eggs. These egg masses are not affected by bluestone, consequently it is imperative that the snails should be destroyed before they lay their eggs, thus bluestone must be broadcast not later than November and June in each year.

Copper sulphate or bluestone costs about 4d. per lb., and as the treatment of affected pastures is simple, and so inexpensive in proportion to the enormous amount of good that will ensue, all sheep-owners are urged to adopt these measures, and carry them out conscientiously.

Sheep-owners should make themselves familiar with the appearance of the fluke snail, and then cause a careful search to be made for them in shallow water around the edges of swamps and in small pools. All should join in a united effort to destroy the snails; and by so doing hundreds of thousands of pounds will be saved annually by the sheep-owners of Australia.

Summary.

To summarize, it is well to draw particular attention to the following essential points:—

(1) Fluke disease is caused by a bag-like worm in the liver.

(2) Fluke eggs cannot hatch in the absence of moisture.

(3) The young fluke must have a particular snail available to carry on its existence.

(4) Sheep affected with adult fluke can be freed of fluke disease by the use of carbon tetrachloride.

(5) Fluke disease can be entirely removed from infested properties by draining all swampy areas, and by following this up with bluestone treatment of moist lands so as to destroy the snails.

APPLE PACKING.

THE PREVENTION OF BRUISING.

By Basil Krone, Fruit Packing Expert.

There is nothing more disappointing to an orchardist than the arrival at its destination of a consignment of fruit in a bruised or damaged condition. To guard against this he should take all possible care in the packing of every case.

But before discussing packing, perhaps it may be worth while to offer a few remarks regarding harvesting, for unless fruit has been carefully gathered, it is not deserving of good packing or any packing at all.

Much bruising is liable to take place from the time apples are taken from the tree until they reach the packing shed, and, therefore, at every step, they should be handled with the greatest of care.

Harvesting.

The ability to recognize a mature apple fit for export is a necessary qualification for every producer. At some stage during its growth, the ground colour of the skin changes from dark-green to light-green or pale-yellow, and this change of colour is a most reliable guide as to maturity.

As an apple matures, the pips also change in colour and become darker, but this *alone* is not a sufficient indication as to whether or not the fruit will show signs of wilting after having been packed for six or eight weeks. This changing condition, considered in conjunction with the apple's general development and surface colourings, will, however, greatly assist an orchardist in coming to correct conclusions during the ripening process.

Accurate Sizing and Grading.

Ever-increasing attention is being paid to accurate sizing and grading by our experienced exporters, for they know that these arts have been mastered by growers in those countries against whose products we must compete in the open market. Uniformly packed cases can result only from uniformly-sized and graded fruit.

Efficient sizing and grading machines of proved efficiency may be purchased for a comparatively small sum. Any one not possessing a grading machine should construct rings or gauges of the various sizes. These can be made at a small cost from wood, tin, cardboard, or celluloid.

It is not necessary, of course, to measure each apple. If one of the correct size be placed in a handy position in front of the packer he will be able to pick out all apples of an approximately corresponding size. This is called grading by the eye, and practice soon makes most people proficient at it.

For export, apples are sorted into four sizes, viz.:—2¼ inches, 2½ inches, 2¾ inches, and 3 inches. These measurements are the

diameters from cheek to cheek. A 2¼-inch apple is one that measures not less than 2¼ inches, but which is under 2½ inches.

An experienced packer normally makes two distinct packs of each grade; he places the larger apples in one case and the smaller in another, thus sorting them into sizes which vary only by one-eighth of an inch in diameter.

Packing

Diagonal "Cheek" Pack.

This system has been adopted in Australia for most of our fruits. Apart from the fact that by this method apples are less liable to bruising, it ensures that the fruit will be packed to the correct height, and that no apple will rest directly on top of another in any direction, yet all will fit firmly.

It is particularly important to see that the fruit in a case is brought to the correct height. No matter how neatly and snugly each layer may be packed, if it is not sufficiently high in the case for the lid to hold the complete contents securely, the packing is a failure. To pack too high causes over-pressing and consequently bruising.

Bruising, as the result of faulty packing, is more liable to occur with some sizes than with others. For instance, it is more difficult to pack 2½-inch Jonathans without bruising them than it is to pack those 2¾-inch in size. Likewise the 3-inch Rome Beauty may be more severely bruised than will one of 3¼ inches, and the Yates of 2⅛ inches will bruise more than will one of 2¼ inches. This bruising will certainly happen unless the spacing or "pocketing" system is not closely watched.

Any one conversant with the packing of apples knows that the sizes I have enumerated are those most difficult to pack. One of our best apples for export is the 2½-inch Jonathan, but, unfortunately, most packers find it very hard to pack this particular apple so as to get the top layer to the correct height. When properly packed on the well-known 2—2 principle, 2½-inch Jonathans look neat and attractive, but if the last layer comes half an inch below the top of the case much of the attractiveness is lost. If to bring the fruit up to the top of the case the apples in the top layer be stacked directly on top of those in the layer beneath, instead of in the spaces, the packs will generally open up slack or bruised.

When using the hardwood dump case, which has been cut a little oversize to allow for shrinkage, the 2—2 pack is always unsatisfactory; the 3—2 pack will give much better results. If a softwood "dump" case, cut to the exact size, is being used, the 2—2 pack should be given a trial, but if after a couple of attempts it is found that the top layer of fruit cannot be brought high enough, a change should be made to the 3—2 method; this will alter the "pockets" or spacing between the apples, and it is the size of these spaces that regulate the height of the fruit in the case. As the height of the fruit is controlled by the tightness of the layer, a study of the spaces between the apples will enable the packer to determine whether the top layer will be in the correct position. This really is the key to the whole situation and can be applied to all sizes and varieties of fruit packed diagonally in any type of case.

Here is an instance of how to apply it to the 3-inch Rome Beauties. If these are packed on the 2—1 system the chances are that—as with the 2½-inch Jonathan—the top layer will come too low, and the result will be a slack package. The 2—2 system will give a much better pack, and bring the fruit to the desired height. In almost every instance, whether softwood or hardwood cases are being used, the 3-inch apple should be packed on the 2—2 principle, *not* the 2—1. The 3¼-inch Jonathan packs correctly with the 2—1 method, but the 3-inch size will never do so.

The other apple mentioned, which sometimes causes confusion, is the 2⅛-inch Yates. They should be packed on the 3—2 system—not the 3—3—but with the fruit "square on," in such a way that the pockets will be made larger. There will, of course, be a smaller number of fruit in each layer, but there will be eight layers in the case, instead of seven. This is an exception to the old packing rule which says:—"All 3—2 packs have seven layers; all 2—2 packs have six, and all 2—1 packs have five layers."

The packer should not adhere too rigidly to rules at all times, but depend more upon his own good judgment, because, if by following a particular rule fruit be brought too high in a case, it would be folly to force it down and nail a thick, unresisting hardwood lid over it; bruising would surely take place. As an indication that the rule is not closely followed at all times, I may mention that many 2—2 packs of oranges, pears, tomatoes, and peaches contain seven layers instead of six.

Hereunder I give the suggested packs for apples of different sizes:—

The 2⅛-inch apple should be packed 3—2, but large "pockets" must be formed by spacing the apples in the bottom layer so as to make the case hold eight layers instead of seven.

The 2¼-inch automatically comes right when the usual 3—2 pack is adopted.

The 2½-inch, in hardwood cases, should be packed 3—2, and not 2—2. The 2—2 pack should be used only in softwood cases, which are usually of the exact size.

There should be no difficulty to pack 2¾-inch apples on the 2—2 method.

The 3-inch apple should, in almost every instance, be packed on the 2—2 method. The 2—1 pack sometimes used should be discontinued.

For the 3¼-inch and larger sizes the 2—1 pack is the best.

SHRINKAGE.

We should also remember that all fruit, some more than others, is subject to shrinkage. Both in cool storage and during transportation a certain amount of shrinkage takes place. At times the method of packing may be at fault in some way, and not hold the fruit firmly. For instance, the lids and bottoms of the cases may be too rigid, and may not grip the fruit, particularly when the packing has been done by inexperienced persons.

THIN FLEXIBLE LIDS DESIRABLE.

Experience has shown the advisability of using a package with rigid sides, but with very thin, flexible lids and bottoms. The Standard, or Canadian case, is popular in markets all the world over. With this, the

fruit may be packed above the top, say, from an inch to an inch and a half at the centre, and from half to three-quarters of an inch at each end to form a "bulge," over which can be nailed the thin, flexible lid; then as shrinkage takes place, the lids and bottoms will contract gradually, and thus the fruit will be held firmly during all stages of transport.

The bulged lids and bottoms are protected by cleats nailed one at each end, top, and bottom. The cases must, of course, be stacked on their *sides* or *ends*—never on the "bulge."

Wood-wool or Corrugated Cardboard Packing.

Fruit is liable to be roughly handled in transit. Therefore the use of wood-wool or corrugated cardboard at the sides of the case, as well as at the top and bottom, is recommended. This is the general practice with Harcourt growers for the inter-state trade, and the amount of bruised and damaged apples it saves more than repays the extra cost involved.

To wire-tie fruit cases is another insurance against loss by broken packages. This practice, I am glad to say, is almost general in Victoria.

Conclusion.

Packing for export is really a simple process, and almost any person can, with a little practice, become acquainted with the standardized methods. The first thing to master is the correct manner of placing each apple in the first layer, which is the foundation of the resultant package.

The beginner should practice slowly with a few boxes some apples of varying sizes until he has mastered the system. He will gain speed and facility each day. His aim should be to have each case neat and attractive.

The Department of Agriculture has a number of illustrated packing charts showing the manner of packing apples of different sizes in both dump and standard cases. Charts of the methods of packing oranges, lemons, pears, peaches, and tomatoes have also been prepared. Any of these may be obtained free on application to the Horticultural Division of the Department of Agriculture, 605 Flinders-street, Melbourne.

WYCHEPROOF CROP AND FALLOW COMPETITION, 1928.

Report of the Judge, A. J. Vasey, B.Ag.Sc., Science Field Officer.

The season 1928, in the Wycheproof district, commenced very favorably with early autumn rains, which allowed of good preparation of the fallows for seeding. Rarely have the crops been sown under better conditions, and germination was good throughout. Unfortunately, a dry, early spring gave a severe check to the crops. Good rains, however, fell at the end of September, and were followed by a comparatively cool October, but the recovery of the district crops varied considerably.

As this competition has only recently been established, it is perhaps desirable that the entries as a whole should be discussed under the headings for which the points are awarded.

Yield.—The average yield of the crops inspected would be about 15 to 18 bushels per acre, with the best promising as high as 27 bushels on both black and red ground. In the marking for yield, it must be remembered that the points awarded do not represent the estimated yield in bushels per acre, but are merely a marking for the relative merits of the crops with a maximum of 35.

Trueness to Type.—The presence of barley and of foreign heads of wheat causes loss of points under this head. In many instances points were lost for the presence of barley and for mixed seed. It is somewhat surprising that more attention has not been paid to the newer wheat varieties such as Ranee, Nizam, Wannon, and Free Gallipoli, which have proved themselves, and can be recommended to the farmers of this district with every confidence. Of these, Wannon is best confined to the black ground.

Disease.—The most serious disease noticed was flag smut, which can be controlled by burning the wheat stubble and growing oats in the rotation. Very little loose smut was seen, and the dry pickle which was largely used had controlled stinking smut or bunt quite successfully.

Weeds.—Weeds were generally confined to a scattered growth of wild oats and mustard, and in only a few cases were these very serious.

Evenness.—The chief losses of points under this head were due to faulty drilling, as the crops, though in many cases short, were fairly even in themselves.

Details of Awards.

Black Ground Crop (Not less than 50 acres).

Competitor.	Yield.	Trueness to Type.	Freedom from—		Evenness.	Total Crop, 1928.	Total Fallow, 1927.	Grand Total.
			Disease.	Weeds.				
Possible Points ..	35	20	15	15	15	100	100	200
A. Kerr ..	31	19	14	14	14	92	97	189
H. Kerr ..	29	18	14	14	15	90	96½	186½
F. Durie ..	27	19	14	13	15	88	95	183
H. J. Rotheram ..	30	17	13	14	13	87	97½	184½
R. J. Ower & Sons	29	16	13	13	13	84	93	177
A. E. Judd ..	23	19	13	13	14	82	96	178
D. Pollard ..	21	17	14	14	15	81	92	173
C. W. P. Wood ..	21	18	13	13	12	77	96	173
H. Morrison ..	11	19	12	13	12	67	96	163

It will be noticed that the above competitors are arranged in order of merit for the crop competition, and although first and second place in the combined crop and fallow go to Mr. A. Kerr and Mr. H. Kerr respectively, Mr. Rotheram beats Mr. Durie by 1½ points for third place in the combined event.

First place in the crop section is awarded to Mr. A. Kerr, whose crop of Wannon promised the highest yield. Further, it was true to type, clean, and free from disease. One point was deducted for overlapping in the drilling. Sown in May, 70 lb. of dry pickled seed and 90 lb. of super. were applied per acre.

A nice crop of Free Gallipoli gained second place for Mr. H. Kerr. It did not promise such a good yield as the winning crop, and a few heads of barley were noticed. These were probably introduced from the hay wheat Tuscan through the chaff fed to the team during cropping operations. The variety Tuscan needs cleaning up on many farms in this district.

Wannon was the variety chosen by Mr. F. Durie for his crop which gained third prize. A fair yield was promised, but points were lost for a thin undergrowth of mustard. Drilling and evenness generally were excellent.

A fine crop of Nizam in Mr. H. J. Rotheram's entry was spoilt as a competitive exhibit by lack of attention to purity of seed and faulty drilling.

Red Ground Crop (Not less than 50 acres).

Competitor.	Yield.	Trueness to Type.	Freedom from Weeds.	Freedom from Disease.	Evenness.	Total Crop, 1928.	Total Fallow, 1927.	Grand Total.
Possible Points ..	**35**	**20**	**15**	**15**	**15**	**100**	**100**	**200**
A. E. Judd ..	31	19	14	14	15	93	97	190
A. Madder ..	30	18	14	14	14	90	96	186
Mrs. Jas. Gray ..	26	16	14	14	14	84	96½	180½
J. McDonald and Sons (1)	27	18	13	13	13	84	93½	177½
J. McDonald and Sons (2)	23	18	13	14	12	80	90	170
R. J. Ower and Sons	25	17	13	13	12	80	94	174
P. Stahl (1) ..	21	19	13	13	13	79	94	173
Milburn Bros. ..	19	19	13	14	13	78	90	168
J. H. Morrison ..	20	19	12	13	13	77	93½	170½
C. W. Wood ..	17	18	13	13	14	75	93	168
J. Curnow ..	22	17	12	14	12	77	92	169
P. Stahl (2) ..	17	16	11	13	11	68	88½	156½

Mr. A. E. Judd was awarded first place in this section with a fine exhibit of Ranee, which gained a high mark under all headings. Sown in May, 80 lb. of seed and 90 lb. of super. were applied per acre.

Ranee was again the variety shown in the second prize crop by Mr. A. Madder. A good yield was promised, and the type was fair, as also was the freedom from weeds and disease. For a May sowing Mr. Madder used 80 lb. of seed and 95 lb. of super. per acre. The area under crop to this variety, Ranee, can be profitably extended in the Wycheproof district, particularly on the mixed and red ground.

The points lost under trueness to type by the entry of Mrs. James Gray were due to mixing of seed of the varieties shown, which were Wannon and Tuscan. This weakness spoilt an otherwise good exhibit.

Returned Soldiers' Section.

Only one entry remained to be judged in the section for Black Ground Crop. This was shown by Mr. C. W. P. Wood. The varieties shown were Penny and Ranee seed 60 lb., and super. 90 lb. per acre were applied in May.

Red Land Crop (Not less than 50 acres).

Competitor.	Yield.	Trueness to Type.	Freedom from—		Evenness.	Total Crop, 1928.	Total Fallow, 1927.	Grand Total.
			Weeds.	Disease.				
Possible Points ..	**35**	**20**	**15**	**15**	**15**	**100**	**100**	**200**
A. E. Holt ..	20	19	14	14	13	80	89	169
C. W. P. Wood ..	19	18	13	13	14	77	93	170
W. A. Holt ..	18	18	13	13	12	74	84	158

While Mr. A. E. Holt wins the crop competition, first place in the combined event goes to Mr. Wood by one point. The lower markings in this section are accounted for by the poor yields obtained in that portion of the district where these entries were located. Mr. A. E. Holt and Mr. Wood showed Ranee, while Mr. W. A. Holt's entry comprised Bald Early and Moira.

The Fallow Competition.

The exhibits in the various sections for fallow were in many instances disappointing, particularly on the black ground. A tendency to use the harrows rather than the combine or the scarifier for the later workings had resulted in many entries having shallow mulches and dry cracking seed-beds.

The judicious use of the combine for spring workings had enabled Mr. H. Rotheram to prepare a very sound fallow with which he wins this class for black ground.

Black Ground Fallow (Not less than 50 acres).

Competitor.	Mulch.	Moisture.	Freedom from Weeds.	Cultivation.	Total.
Possible Points	**25**	**25**	**25**	**25**	**100**
H. Rotheram	23	23	25	22	93
Mrs. Jas. Gray	22	23	22	23	90
F. W. Judd	20	23	23	20	86
A. Kerr	20	20	24	20	84
H. Morrison	20	21	23	20	84
H. Kerr	19	20	23	19	81

As will be seen from the following markings some good fallows were shown in the red ground section, the winner being very hard to fault in any particular.

The methods used with success in the cultivation of this country may be summarized as follows:—

(1) An early ploughing and harrowing followed by a cultivation practically to the depth of ploughing. This brings the clods to the top and leaves the fine soil below. Until this has been done, satisfactory consolidation of the seed-bed cannot be obtained.

(2) Further cultivations later in the spring can be at a shallower depth, but must leave a good 2½ to 3 inches of mulch to carry the fallow over the summer.

(3) Autumn workings depend on the seasonal conditions, but should be designed to allow of sowing in May on to the seed-bed at a depth of 1 inch. Deep sowing is dangerous on this class of land.

Red Ground Fallow (Not less than 50 acres).

Competitor.	Mulch.	Moisture.	Freedom from Weeds.	Cultivation.	Total.
Possible Points	**25**	**25**	**25**	**25**	**100**
V. Dillon	24	24	25	24	97
J. McDonald and Sons (1)..	23	23	25	23	94
J. Coatsworth	23	23	24	22	92
A. A. Madder	21	23	24	21	89
J. McDonald and Sons (2)	21	23	24	20	88
A. E. Judd	21	23	24	20	88
T. Ison (3)	20	22	24	20	86
T. Ison (2)	21	20	24	20	85
A. Morrison	20	21	23	21	85
L. Notley	21	21	23	21	86
T. Ison (1)	18	20	25	19	82
J. Stahl	18	20	23	19	80
P. Stahl..	19	18	24	18	79

DIMBOOLA CROP AND FALLOW COMPETITION.

Report of Judge, W. B. Miller, M.Agr. Sc., Inspector of Agriculture.

At the time of judging, crops in the Dimboola district promised to exceed average yields. Following the set-back due to the rainless period in August and September after a dry winter, the spring rains ensured a good harvest and thick crops. Generally speaking, however the wheat heads were smaller than in a good season. It was expected that the average yield of the crops shown in the open crop competition would be 10 bags per acre.

The area covered by the competition has a radius of 15 miles from the Dimboola post office. Certain tracts of Mallee country where the soils vary from sands to heavier red loams are included, but the majority of the competitors farm on the heavy black flats between Wail and Katyil.

For competition purposes, handicaps are given to those who are cultivating poorer soils. Seasonal conditions are considered when allotting the handicaps each year.

This year they were as follows:—

Grey Mallee soils	5 points
Heavy red loams	4 ,,
Heavy Mallee fringe red loam ...	10 ,,
Mallee sand	8 ,,

Frosts.

A few crops in the district were seriously affected by frosts at the end of October, but, in most cases, the damage was confined to one or two grains in some of the heads. Frost damage is indicated when some grains in the head are missing while others are well filled. It is not only in the tip that grains may be frosted; they may be missing from any part of the head.

It is when the wheat head is at the flowering stage that injury is likely to occur; the head usually commences to flower at the middle, and flowers at the tip and base afterwards. Only those parts of the head which are actually at the most susceptible stage are killed by a light frost, but a heavy frost may damage the larger part of the head.

The sensitiveness of the wheat plant to frost was strikingly illustrated on the farm of Mr. V. Harders. It was noticed that the crop on the double-sown corners, in one part of the field, was badly frosted; that in the main crop was but lightly frosted, and some in a crab-hole was not affected at all. Such happenings are explained by the fact that the doubly manured wheat usually matures earlier than the main crop, and that in the crab-holes a few days later, so that the three crops were at different stages when the frost occurred.

It is possible that some varieties are more likely to suffer from frost than others, but of this little is known. In some cases, Free Gallipoli appeared to have suffered less than Wannon sown alongside, but in other cases the position was reversed. The deciding factors appear to be the stage of maturity of the wheat, and the severity of the frost.

Crops Sown on Stubble Land.

The advantages of sowing the wheat crop on well prepared fallow are well recognized in the Dimboola district, and the standard of the leading fallows exhibited this year leaves little to be desired. There are occasional times, however, when a crop may be sown to advantage on stubble land.

Where crops failed in 1927, the paddocks were usually summer fallowed in order to sow to wheat again in 1929.

Owing to favorable conditions for cultivation in the summer, the abundance of sheep feed, and to the possibilities of the usual wet year following a dry one, many such paddocks were sown again with wheat in 1928.

In some cases where the land had been thoroughly cultivated in order to conserve as much as possible of the summer rains, crops yielding up to eight bags an acre were grown, but where the stubble land was merely ploughed and harrowed a short time before sowing, light crops resulted.

Mr. W. Fechner grew a successful crop on oaten stubble. After "sheeping" the paddock heavily, he scarified it shallowly in February, following with the harrows. In April, the paddock was scarified and

harrowed, and the crop was sown with the combine during the third week of June. Such a departure from the usual practice is risky, and requires more than normal team strength if the cultivation of the fallow is to be carried out properly.

Varieties.

Free Gallipoli was the wheat favoured by most competitors, and it appears to be gaining in popularity. Slightly heavier quantities should be sown than is the practice with Federation. The other varieties grown by competitors were Wannon, Huf's Imperial, Federation, Yandilla King, Nizam, and Red Russian.

Heads of Free Gallipoli Wheat from Dimboola.

1. Normally filled head.
2, 3, 4, and 5. Heads showing frosted spikelets marked (*f.*); these spikelets are empty, but the others contain normal grain.
6. Head almost completely frosted.
7. "Dead head" caused by "take-all" a fungoid disease of the wheat roots. All the spikelets contain shrivelled grain only.

Diseases.

In practically every case the seed had been dry pickled, and no ball smut was noticed.

Though traces of loose smut and rust were observed, these diseases did not greatly reduce the yield.

Several crops had been attacked by take-all, and others by flag-smut. Paddocks in which these two diseases are established should be closely watched, and if the disease spreads, a rotation with oats may be necessary. In the meantime, care should be taken to burn the stubble as early as possible, and thorough cultivation of the affected areas of soil practised.

Crop Awards.

Competitor.	Variety.	Apparent Yield.	Purity and Trueness to Type.	Absence of—		Evenness.	Handicap.	Total.
				Weeds.	Disease.			
Possible Points ..	.. .. ..	35	20	15	15	15	10	110
SECTION 1.—FOR THE BEST 120 ACRES OF WHEAT CROP ON MALLEE LAND GROWN BY FARMER WORKING OVER 640 ACRES OF LAND.								
A. O. Mibus ..	Free Gallipoli and Wannon	24	19	14	15	14	5	91
W. Sallman ..	Free Gallipoli ..	22	18	14	13	13	10	90
SECTION 3.—FOR BEST 80 ACRES OF WHEAT ON MALLEE LAND GROWN BY FARMER WORKING LESS THAN 640 ACRES.								
G. Schaefer ..	Red Russian ..	24	19	14	15	14	8	94
G. J. Glatz ..	Free Gallipoli ..	21	19	15	14	14	10	93
A. Howland ..	Federation ..	22	19	15	13	13	8	90
E. L. Mibus ..	Free Gallipoli and Federation	24	18	13	15	14	5	89
V. H. Harders ..	Free Gallipoli and Yandilla King	24	18	14	11	13	5	85
SECTION 10.—FOR BEST 80 ACRES OF CROP GROWN ON FALLOW EXHIBITED IN THE 1927 COMPETITION FOR THE MALLEE LAND.								
G. J. Glatz ..	Free Gallipoli ..	21	19	15	14	14	10	93
A. O. Mibus ..	Free Gallipoli and Wannon	25	19	14	15	14	5	92
V. H. Harders ..	Free Gallipoli ..	24	18	15	14	14	5	90
SECTION 5.—FOR BEST 120 ACRES OF CROP ON NON-MALLEE LAND EXHIBITED BY FARMER WORKING OVER 640 ACRES OF LAND.								
R. Fechner ..	Free Gallipoli ..	33	19	14	15	14	..	95
H. Walsgott ..	Free Gallipoli and Wannon	32	18	13	15	14	..	92
H. Fechner ..	Free Gallipoli ..	31	19	14	14	14	..	92
W. Fechner ..	Free Gallipoli ..	31	19	14	14	14	..	92
H. Holland ..	Huf's Imperial	31	19	13	14	14	..	91
Black Bros. ..	Free Gallipoli and Wannon	30	19	13	14	14	..	90
P. Miller ..	.. ..	28	19	13	14	13	..	87
SECTION 7.—FOR THE BEST 80 ACRES OF GROWING CROP ON NON-MALLEE LAND BY FARMER WORKING LESS THAN 640 ACRES.								
P. Rogers ..	Free Gallipoli ..	33	19	14	15	14	..	95
H. Wills ..	Wannon ..	31	19	14	15	14	..	93
N. L. Harders No. 2	Free Gallipoli and Federation	26	19	13	14	13	4	89
N. L. Harders No. 1	Yandilla King and Federation	27	18	12	14	13	4	88
SECTION 9.—FOR BEST 80 ACRES OF CROP GROWN ON FALLOW EXHIBITED IN 1927 COMPETITION FOR NON-MALLEE LAND.								
R. Fechner ..	Free Gallipoli ..	33	19	14	15	15	..	96
P. Rogers ..	Free Gallipoli ..	33	19	14	15	14	..	95
H. Wills ..	Wannon ..	30	19	13	15	15	..	92
P. Muller ..	.. ..	30	19	14	14	14	..	91
N. L. Harders ..	Free Gallipoli and Federation	26	19	13	14	13	4	89
A. J. Lehmann ..	Nizam ..	25	19	14	15	14	..	87

Crop Awards—*continued.*

Competitor.	Variety.	Apparent Yield.	Purity and Trueness to Type.	Absence of—		Evenness.	Handicap.	Total.
				Weeds.	Disease.			
Possible Points		**35**	**20**	**15**	**15**	**15**	**10**	**110**
SECTION 11.—FOR BEST 80 ACRES OF WHEAT, OPEN TO ALL SECTIONS.—TO BE WON THREE TIMES.—P. H. MULLER CUP.								
R. Fechner No. 1	Free Gallipoli ..	34	19	14	15	15	..	97
P. Rogers ..	Free Gallipoli ..	33	19	14	15	14	..	95
R. Fechner No. 2	Free Gallipoli ..	33	19	14	15	14	..	95
H. Walsgott ..	Free Gallipoli ..	33	19	14	15	14	..	95
W. Fechner ..	Free Gallipoli ..	32	19	14	14	14	..	93
G. Glatz ..	Free Gallipoli ..	21	19	15	14	14	10	93
A. Mibus ..	Free Gallipoli and Wannon	25	19	14	15	14	5	92
P. H. Muller ..	.. ..	30	19	14	14	14	..	91
N. Harders No. 2..	Free Gallipoli and Federation	26	19	13	14	13	4	89
E. Mibus ..	Free Gallipoli and Federation	24	18	15	13	14	5	89

Crops on Mallee Land.

The greater part of the crop of Mr. A. O. Mibus, who won in section 1, was Wannon, and was grown on fringe Mallee grey loam, but the heavier portion, 40 acres of Free Gallipoli, was on a red rise. Both crops were true to type, and, except for some wild oats, they were clean. The heads of the Free Gallipoli were particularly well filled. The grey loam had been cultivated as follows:—After a fallow-wheat-oats rotation, the paddock was summer fallowed with the spring-tooth in the autumn, skim-ploughed shallowly in July, spring-toothed and harrowed in October, and harrowed again in November. The fallow was then harrowed in February, spring-toothed in February and May, and 70 lb. of seed and 100 lb. of superphosphate were sown with the combine during mid-June. The land carrying the heavier part of the crop, Free Gallipoli, received an extra stroke with the scarifier in April, and was sown early in June. Neither of the crops was fed off, and they were not in ear until after the rain in early October.

Mr. Sallman's crop at Lochiel was a heavy one, but many of the heads were empty, or contained shrivelled grain due to attacks of take-all.

In section 3, several crops appeared to be equally heavy, but were separated under other headings as shown in the table. Mr. Schaefer finds that the Red Russian, which has a white head but red grain, yields well on his red and grey Mallee sand, though a plot of Free Gallipoli appeared to be as heavy. The crop was true to type, except for an occasional red head, and the grain had filled well, it was heavier on the red hill. The summer fallow had been disked to a depth of 3 inches in March, 1927, scarified in July and August, spring-toothed in October,

and again after the February rains. In March, it was scarified, and in June, 80 lb. of seed and 120 lb. of manure were sown with the combine. The earlier-sown part of the crop was the heavier.

In section 10, Mr. G. J. Glatz was awarded first prize for the same crop that was second in section 3. His crop of Free Gallipoli was grown on red loam, but was light on parts of a hill which contained much buckshot, which had been wind swept. The crop was grown on winter fallow, which had been well cultivated in 1927. It was combined in January and February, 1928, and scarified in April.

Ninety lb. of seed and 120 lb. of manure were sown in the second week of May.

The crops on the Mallee ground were very satisfactory for such a season. A notable feature was the heaviness of the seed and manure applications. The average amount used by competitors in the Mallee sections was 80 lb. of seed and 101 lb. of superphosphate per acre.

Crops on Black Land.

The crops grown on the rich black plains were very heavy, and considerable difficulty was experienced in separating the leading exhibits.

Mr. R. Fechner's crops of Free Gallipoli were considered the heaviest entered in the competition, and portion of them were awarded first place in sections 5, 9, and 11. The heads were well filled, disease was practically absent, and the crops had been well put in. A few wild oats and an odd head of barley were the only impurities.

The fallow which obtained second prize last year had been cultivated solely with the scarifier and harrows. The land was summer fallowed with the scarifier in March 3½ inches deep, scarified in early July 2½ inches deep, harrowed in August, scarified with drag harrows in September, harrowed in November, scarified with harrows immediately after the February rain, scarified in May and harrowed in early June.

The crop was sown in mid-June with the combine; 75 lb. of seed per acre and a similar quantity of manure were used. The ground was harrowed a few days after sowing, and the crop was not fed off.

The part of the crop entered in section 9 contained a few frosted heads, but it was very heavy. It was sown in early June.

Mr. P. Rogers, who won in section 7, showed a crop of Free Gallipoli about 3 feet high, which in many places was heavier than that of Mr. R. Fechner's, but it was not so even, and not quite so well drilled The type was good, and the only weeds were a few wild oats. It was grown on last year's winning fallow, which had been scarified in March, scarified and harrowed in July, again in August, and also in October. The harrows were used after rain in November. In February and in May the scarifier and harrows were used, and the crop was put in with the combine during the first week of June. Eighty lb. of both manure and seed were used, and the crop was not fed off.

Mr. Walsgott's crops were good, but not quite so true to type, nor so free from weeds as the winner's.

The majority of the remaining crops, though not quite so heavy, were a credit to the competitors.

Although saffron thistles and musk may be seen about the district, practically none was noticed in the competition crops. The best of the crops in the district appear to have been sown during the first three weeks

of June. In this regard, the results given below of official tests at Salisbury are of interest:—

Time of Sowing.	Average Yield for Six Years, 1921–1926.
	Bushels per acre.
Mid-June	40·4
Mid-July	37·3
Decrease due to late sowing ..	3·1

The average amount of manure used per acre by competitors on the black soils was 104 lb. per acre, and seed 78 lb.

Fallow Section.

A high standard was set by each competitor in that part of the fallow entered for competition, and it was noted that, in most cases, the remainder of a competitor's fallow was in good order. The popularity of summer fallowing is emphasized by the fact that of the eighteen entries, fourteen had been summer fallowed. It was to be expected that the area of summer fallow would be below normal, as more time than usual was spent in preparing fallows of the previous year for sowing. Large areas, however, were summer fallowed, and it is quite evident that, in this season at least, more moisture had been conserved in this way.

Summer fallowing involves the cultivating of the land during the summer or autumn from thirteen to eighteen months before sowing. Either the plough, disc-cultivator, sundercut, scarifier, or spring-tooth cultivator may be used, and the fallow may be re-ploughed, or only cultivated again in the following July or August.

At Dimboola, on the uniform black plains, the scarifier is most popular. At Nhill, and in places where patches of heavy red land are commonly found in each paddock, the sundercut or plough is generally used.

In order to keep the soil in mellow condition, paddocks may be winter fallowed and summer fallowed alternately.

The summer rains of 1928 provided a good opportunity for making summer fallow, and although the spring had been dry, it was found that the fallows were well charged with moisture, and that the seed-beds were in good order.

Fallow Awards.

The awards in the various sections are tabulated below:—

Name.	Mulch.	Moisture.	Absence of Weeds.	Cultivation.	Total.
Possible Points	**25**	**25**	**25**	**25**	**100**
Section 2.—For Best 120 Acres of Fallow on Mallee Land Exhibited by Farmer owning over 640 Acres of Land.					
A. O. Mibus (No. 1) ..	21	24	25	24	94
A. O. Mibus (No. 2) ..	18	23	22	23	86

Fallow Awards.—*continued.*

Competitor.	Mulch.	Moisture.	Absence of Weeds.	Cultivation.	Total.
Possible Points	25	25	25	25	100
Section 4.—For Best 80 Acres of Fallow on Mallee Land Exhibited by Farmer owning less than 640 Acres.					
V. Harders No. 1	21	24	25	24	94
G. J. Glatz	20	24	25	23	92
V. Harders No. 2 ..	19	24	23	22	88
E. L. Mibus	19	23	23	22	87
Section 6.—For Best 120 Acres of Fallow on non-Mallee Land Exhibited by Farmer owning over 640 Acres of Land.					
A. Walsgott	24	24	25	24	97
H. Holland	23	24	25	24	96
R. Fechner	22	24	25	24	95
P. Muller	21	24	25	24	94
Flack Bros.	22	24	25	23	94
W. J. Westerndorf ..	21	24	25	24	94
H. Fechner	21	24	25	23	93
H. Pietsch	20	24	24	23	91
A. J. Lehmann	23	22	25	21	91
Section 8.—For Best 80 Acres of Fallow on non-Mallee Land Exhibited by Farmer working less than 640 Acres.					
P. Rogers	22	25	25	24	96
H. Wills	22	24	25	24	95
G. J. Glatz	20	22	25	21	88

Comments on the Fallows.

Mallee Soils.

Mr. A. O. Mibus was the only entrant in section 2. His No. 1 entry was in good order. The sundercut was used to a depth of 3½ inches in March, the scarifier in July, and the combine in August, October, and again at the end of October, followed by the harrows.

Mr. V. Harders, who won section 4, had fallowed a grey flat with rises of red loam covering a red clay at a depth of about 5 inches. The fallow had been well cultivated, though in some places the mulch was deeper than 3 inches. The plough was used in fallowing this paddock in April to a depth of 3 inches, and the scarifier in June, early August, and mid-October.

Mr. Glatz showed a paddock of heavier loam. The mulch was more cloddy, as is desirable on such soils, but it was not quite even in depth, nor as high in moisture content.

It was ploughed in March, and had received nine more cultivations up to the end of November.

Black Soil.

Mr. Walsgott showed a very fine fallow. The depth of mulch was nearly 3 inches, which had been the maximum depth of working. The mulch was in nice, crumbly condition, and very even. The moisture content of the seed-bed was the highest seen. Slight variations in the

depth of the mulch meant the loss of 2 points. In March the paddock was scarified 2 inches deep, and early in May to a depth of 3 inches. It was harrowed in July, scarified in early August, scarified in October, and harrowed early in November.

Mr. Holland's fallow was beaten only because it held a little less moisture than did that of the winner. The paddock contains some brown and chocolate soil as well as black, and a few patches of heavier red loam, which had been treated very successfully with gypsum. The cultivation of the paddock was as follows:—Disked in March to 3 inches; scarified in May, scarified in July, harrowed in August, scarified in October, and harrowed in November. The knife bar was used also on part of the fallow.

Mr. P. Rogers had prepared an excellent seed-bed, covered by a mulch of 2½ to 3 inches in depth. Despite the frequent use of the harrows, the mulch was not too fine. This fallow had been prepared very early in the year. It was scarified to a depth of 4 inches and harrowed in February and March, harrowed in April, scarified in July and in August, harrowed again in August, scarified at the end of October, and early in November. Each time the scarifier was used, light harrows were dragged behind. Each cultivation was at right angles to the previous one.

The fallow of Mr. Wills was also very good, but the mulch was not quite so even.

The majority of the other fallows lost points for such details as slightly irregular cultivation, or the presence of a few wild oats.

Mr. Lehmann is trying an experiment with a very deep mulch—5 inches in many places.

The average number of cultivations given the several fallows up till the end of November was eight. Such intense cultivation is an indication of the high standard of farming in the district.

The number of entries in the crop sections, 38, showed an increase over the number for 1927. It is to be regretted, however, that some competitors who show their crops do not also enter their fallows for competition.

WESTERN DISTRICT WHEAT TESTS.

HEAVY YIELDS AT WILLAURA.

Exceptionally heavy wheat yields were obtained last year on the plots conducted by the Department of Agriculture on the farm of Mr. J. Shalders, at Willaura. That of the new variety, "Ghurka" (46.6 bushels per acre) was the highest from any of the experimental plots in the State. Other varieties which gave high yields under the conditions obtaining at Willaura were Free Gallipoli (43.4 bushels per acre), and Sepoy Selection (40.9 bushels per acre). For several years the experiments on this field have indicated that it was likely that varieties such as Federation, Yandilla King, and Turvey could be supplanted with advantage, and the results this year confirmed that view. At all events, there is no reason why farmers at Willaura should continue to grow a variety like Turvey, which has been proved to give

yields substantially lower than the newer varieties named. An additional disadvantage of Turvey is that it has a tendency to shed its grain.

The yields of the wheat variety trials at Willaura for the year are as follows:—

	Bushels per acre.
Ghurka	46.6
Free Gallipoli	43.4
Sepoy Selection	40.9
Nizam	39.9
Major	39.9
Mogul	37.8
Federation	37.1
Yandilla King	36.5
Turvey	34.3
Bena	32.7
Braemar Velvet	26.8

The consistency of the two leading varieties, Ghurka and Free Gallipoli, and their superiority to Turvey is shown by the average results over the past three years, in each of which Ghurka has headed the list. The average yield of Ghurka for the three years was 36.8 bushels per acre. Over the same period, Free Gallipoli had the next highest average (35.3 bushels), while Nizam was next with 32.5 bushels, followed by Federation (32.3 bushels), Major (31.7), and Yandilla King (31.3). Turvey was at the bottom of the list with an average yield of 28.6 bushels per acre. Ghurka is a mid-season variety with a short, erect straw.

The variety plots were sown on fallow on the 22nd and 23rd May. Dry pickled seed was used at the rate of 75 lb. per acre, and 1½ cwt. of 22 per cent. superphosphate was applied with the seed.

Results of the manurial plots, which are each ¼ acre in area, and which were sown with Federation wheat at the rate of 75 lb. per acre, are shown in the following table, together with the average yields over the last three years:—

	Yield, 1928. Bushels per acre.	Three years' average, 1926–27–28. Bushels per acre.
No manure	21.7	18.8
Agricultural lime, 20 cwt. per acre	21.5	20.2
Bone fertilizer, 1 cwt. per acre	24.6	22.3
Basic phosphate, 1 cwt. per acre	31.7	29.1
Superphosphate, 1 cwt. per acre	34.8	30.1
Agricultural lime, 20 cwt., and superphosphate, 1 cwt.	35.3	31.8
Superphosphate, 2 cwt.	37.1	31.9
Superphosphate, 1½ cwt.	37.4	32.3
Local gypsum, 20 cwt., and superphosphate, 1 cwt.	37.9	32.6
Agricultural lime, 20 cwt., and superphosphate, 2 cwt.	38.8	34.1

These tests have demonstrated that in this portion of the Western District, as in other wheat-growing centres, the most effective fertilizer for the wheat crop is superphosphate. In this connexion it should be noted that over the past three years a dressing of superphosphate at the rate of 1 cwt. per acre has resulted in an increase in yield over the unmanured plot of 11.3 bushels per acre. Where 1½ cwt. of superphosphate per acre was used, the increase due to the fertilizer was 13.5 bushels per acre, and with 2 cwt. of superphosphate an increase of 13.1 bushels per acre was obtained. If the extra wheat be valued at 4s. a bushel, and the cost of the fertilizer on the farm be deducted, it will be

seen that the extra return due to the fertilizer in the case of the 1 cwt. dressing is 39s. 5d. an acre; with 1½ cwt. it is 45s. 4d.; and with 2 cwt., 40s. 11d. an acre. Thus, if Willaura wheat-growers, whose land is similar to that on which the plots are located, desire to obtain the maximum results from their crops, they should apply superphosphate at the rate or 1½ cwt. per acre.

The results have shown conclusively that, for wheat-growing under the conditions obtaining in this district, superphosphate is superior to both basic phosphate and bone fertilizer. Where lime and gypsum have been applied in combination with superphosphate, the yield has been still further increased, but, so far, not to an extent sufficient to justify the expenditure involved in applying either of these to the land.

ULTIMA CROP AND FALLOW COMPETITION.

Report of the Judge, R. L. Twentyman, B.Ag.Sc., Science Field Officer.

The Ultima branch of the Better Farming Association is to be congratulated on the successful crop and fallow competition conducted by it this year.

It was gratifying to find that in the Ultima district members were taking a keen practical interest in the association's efforts towards the realization of "better farming."

Crop and fallow competitions give the farmers an excellent opportunity for comparing their methods with those of their more or less successful neighbours. Unfortunately, however, it is usually found that those who have most to gain from such competitions are those who take least interest in them.

As was expected, most of the crops had suffered as a result of the dry spring, but all had not been affected to the same extent. The most forward and promising crops generally suffered most severely owing to the more vigorous growth exhausting the supplies of soil moisture, whereas the thin and backward crops had not made such heavy demands on the supplies of moisture in the soil, and thus were able to hang on better until the rains came.

In a few instances, stubble crops had done remarkably well, and compared very favorably with adjoining crops grown on fallow. These good crops on stubble land were sufficiently rare to cause much discussion, and have received much more publicity than the numerous poor, thin stubble crops, the failure of which has been taken as a matter of course, and of which very little is heard.

In view of the scanty rains which fell during the early part of the previous fallowing period, it was to be expected that stubble land worked up immediately after the summer rain should contain practically as much moisture as the fallow. If the storage of moisture was the sole object of fallowing, we should have expected just as good crops from the stubble land as from the fallow. But just as important as the storage of moisture is the making available of plant food, and in this respect the fallow ground was well in advance of the stubble.

The past season has been a most unusual one, and farmers will be well advised not to abandon proved methods merely because occasional "scratched in" crops have been successful this year. Some varieties of wheat which normally do well in the Ultima district did not do so well this year, as they had commenced to ripen before the rain came, and in consequence did not recover, as did late varieties which were still green, and received the full benefit of the rain. Much of the risk attached to growing any one variety is eliminated if sections of early, mid-season, and late varieties are sown.

Like other Mallee districts, Ultima had many of its crops heavily affected with flag smut. In some cases the thinning of the plants may have been a slight advantage, but in others where infection was very much heavier the yield had been reduced. In a normal season, such a widespread infection of flag smut would do very much damage. Where crops were heavily affected with this disease every effort should be made to obtain a good burn to destroy the infected straw, or it will soon be blown on to near-by fallows. A good burn followed by a clean fallow affords the only means of checking this disease.

Most of the crops in the competition were free from loose smut, and there was practically no ball smut.

Following are the points awarded in the crop competition:—

Light Land.—Combined Crop and Fallow Competition.

Competitor.	Variety.	Yield.	Type.	Evenness.	Absence of—		Total for—		Grand Total.
					Weeds.	Disease.	Crop.	Fallow, 1927.	
Possible points ..	.. .. ..	**35**	**20**	**15**	**15**	**15**	**100**	**100**	**200**
T. W. Atkins ..	Free Gallipoli ..	28	18	12	13	13	84	95	179
A. V. McKenzie ..	Nabawa	26	18	13	14	14	85	93	178
C. White	Joffre	32	17	12	14	13	88	88	176
W. H. King ..	Joffre	29	16	12	12	13	82	90	172
P. R. Olsen ..	Joffre, Rajah, Waratah	32	17	12	14	12	87	84	171
M. W. McGuinness and Sons	Ranee	25	18	13	11	13	80	87	167
P. R. Olsen ..	Nabawa	24	17	12	13	14	80	85	165
H. C. Brown ..	Joffre, Free Gallipoli ..	20	17	13	12	14	76	89	165
M. W. McGuinness and Sons	Free Gallipoli ..	19	18	12	10	13	72	86	158
N. H. Kent ..	Bald Early	24	18	12	10	13	77	80	157
H. Booth ..	Nabawa	18	16	12	12	12	70	85	155

Mr. C. White obtained first place with 88 points in the crop competition with a fine entry of Joffre wheat. It had been sown with 90 lb. of super. and 60 lb. of formalin-pickled seed during the first week of May, and was harrowed six days later. The crop was almost entirely free from weeds, but it included some thin patches.

Mr. P. R. Olsen's crop obtained second place with 87 points. It included Joffre, Rajah, and Waratah, and gave promise of a fine yield, but points were lost for evenness and freedom from disease. This

crop had been sown at the end of June with 60 lb. of dry-pickled seed and 90 lb. of super.

Following are the points awarded in the crop competition:—

Heavy Land.—Combined Crop and Fallow Competition.

Competitor.	Variety.	Yield.	Type.	Evenness.	Absence of—		Total for—		Grand Total.
					Weeds.	Disease.	Crop.	Fallow, 1927.	
Possible points ..	.. .. ..	**35**	**20**	**15**	**15**	**15**	**100**	**100**	**200**
E. T. Butler ..	Ranee	27	18	13	14	13	85	93	178
A. Johnson ..	Hard Federation ..	29	19	13	13	13	87	90	177
H. C. Ferrier ..	Bald Early, Yandilla King	23	18	12	12	12	77	90	167
H. C. Brown ..	Nabawa	22	18	12	11	11	74	89	163
D. A. Baird ..	Ranee	21	18	14	13	12	78	85	163
G. Bailey ..	Ranee, Yandilla King ..	25	17	13	12	13	80	80	160
D. M. McKenzie ..	Nabawa	22	17	12	13	14	78	81	159
W. R. Cole ..	Joffre	20	17	11	10	13	71	87	158
H. F. Kelly ..	Free Gallipoli, Nizam ..	16	17	12	10	13	68	87	155

Mr. A. Johnson's entry of Hard Federation obtained first place in the crop competition with 87 points. It was a nice clean crop, very true to type. It was sown during April with 65 lb. of bluestone-pickled seed and 70 lb. of super.

Mr. E. T. Butler's crop of Ranee was second with 85 points. It was sown at the middle of May with 80 lb. of dry-pickled seed and 90 lb. of super. It was harrowed five days after sowing.

Fallow Competitions.

There was a good entry for the fallow competition, no less than 29 fallows being judged. In order that the fallows might compete on more even terms, it was decided to make two classes for the competition—a heavy and a light class. Unfortunately, the soils of the district vary gradually from those that are decidedly heavy to those that are moderately light, and although there is no question as to the class to which most of the fallows belong, there are a few that are on the border line, and which might be placed in either class.

Generally the fallows were in excellent condition at the time of judging. The moisture content was high, weeds usually were few, and in most cases the mulch was in splendid order, the ground having been well worked after the October rains. On the lighter ground paddy melons were starting to make active growth. With such abundant supplies of moisture in the soil they will make rapid headway if left to grow unchecked. Once they get beyond the control of the sheep the value of the fallow will be greatly reduced. Weeds

on the fallow must be regarded as a means for the leakage of the stored-up moisture, and the more that escapes through them the less moisture there will be available for the crop.

A very noticeable feature of the competition fallows was the contrast between the seed bed as left by the spring-tooth and by the rigid-tyned implements. The spring tynes are continually being strained by the stumps, with the result that the depth of working often becomes very uneven. Although this is not a matter of serious consequence early in the fallowing period, the fallow would be seriously injured if treated in this way prior to seeding. The last workings of the fallow should, if possible, be given with a rigid-tyned implement, or else considerably more care should be given to the setting of the spring tynes.

Ultima Fallow Competition.—Light Ground. Area 50 Acres.

Competitor.	Moisture.	Mulch.	Cultivation	Absence of Weeds.	Total.
Possible points	**25**	**25**	**25**	**25**	**100**
E. T. Butler	24	23	23	24	94
P. Olsen	24	23	22½	23½	93
W. H. King (1)	24	23	22	24	93
T. W. Atkins	23	23	23	23	92
C. White	24	23	22	22	91
M. W. McGuinness & Sons ..	22	21	22	24	89
E. G. Richardson	23	22	22	21	88
W. H. King (2)	23	21	22	22	88
N. H. Kent	22	22	22	21	87
A. V. McKenzie	22	21	21	22	86
H. C. Ferrier	22	21	21	22	86
P. Olsen	22	20	22	22	86
A. French	23	21	21	21	86
N. R. Cole (1)	22	21	22	19	84
A. Johnson	21	18	19	20	78
N. R. Cole (2)	20	18	19	19	76

Mr. E. T. Butler's entry obtained first place with 94 points. It was a fine uniform fallow, almost entirely free from weeds, and the moisture content was excellent. It had been ploughed with the Sundercut during June and July and again in August. It was spring-toothed during the first week in October and harrowed in November.

Mr. P. Olsen and Mr. W. H. King were equal second with 93 points each. Mr. Olsen's fallow had been ploughed during the middle of July and harrowed in August. It was next harrowed immediately after the rain in October, and then spring-tooth cultivated in mid-October.

Mr. King's fallow was ploughed in the middle of July and harrowed and cross-harrowed immediately. It was harrowed twice at the end of August, spring-toothed and harrowed in October; it was next spring-toothed early in November.

Heavy Ground Competition.—Area 50 Acres.

Competitor.	Moisture.	Mulch.	Cultivation.	Absence of Weeds.	Total.
Possible Points	25	25	25	25	100
G. Marks	23	23	22	23	91
W. Sayers	23	22	22	22	89
J. L. Thomas	22	22	22	22	88
H. F. Kelly	21	20	22	23	86
G. Baily	22	20	21	22	85
D. M. McKenzie	22	20	21	22	85
A. Moller	22	21	20	21	84
M. Hamilton	21	21	21	21	84
D. E. Fordham	21	20	19	22	82
L. G. Finlay	22	21	21	18	82
T. O'Brien	21	19	20	21	81
D. A. Baird	20	18	19	21	78
W. A. Pedley	20	19	19	18	76

Mr. G. Marks was first with 91 points. The mulch on this fallow was in very good order, and there were very few weeds present. Mr. Marks was absent at the time of judging, and the fallow workings were not obtained.

Mr. W. Sayers' entry was placed second with 89 points. He was also absent at the judging, and the workings were not received. The mulch of this fallow was not in such good order as that of the winning fallow, and weeds were more numerous.

Mr. J. L. Thomas obtained third place with 88 points for his entry. This fallow was ploughed from 2½ to 3 inches deep in July and harrowed immediately. It was again harrowed in August, and combined at the middle of October. The moisture content was not as high as in the first two fallows, and like the second fallow there was a fair number of young weeds present.

MARKETING SYNTHETIC RUBBER.

Negotiations, it is reported from Cologne, are pending between the Continental Caoutchouc and Guttapercha Company in Hanover, and the I.G. Farbenindustrie, relative to placing on the market synthetic rubber produced by the Trust. Judging from the information contained in the report, it would appear that the production of synthetic rubber has reached a stage which makes it a profitable commercial proposition. The directors of the German Dye Trust are very reticent as to the success attained in producing synthetic rubber on a commercial basis, but a statement that one of their members recently placed detailed information before a meeting of industrialists in the United States lends additional colour to the supposition that great progress has been made in that direction.

STANDARD HERD TEST.

Report for Quarter ended 31st December, 1928.

In the following is set out the records of all cows which completed a lactation during the quarter. The number is 209, of which 146 qualify for the certificate.

The amount of butter fat required for qualification varies according to the age of the animal (up to 5 years at time of calving), the standards being as follow:—

Junior 2 year old (under 2½ years at time of calving)	200 lb. butter fat.
Senior 2 year old (between 2½ and 3 years at time of calving)	225 lb. butter fat.
Junior 3 year old (between 3 and 3½ years at time of calving)	250 lb. butter fat.
Senior 3 year old (between 3½ and 4 years at time of calving)	275 lb. butter fat.
Junior 4 year old (between 4 and 4½ years at time of calving)	300 lb. butter fat.
Senior 4 year old (between 4½ and 5 years at time of calving)	325 lb. butter fat.
Mature cow 5 years and over	350 lb. butter fat.

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
J. Anderson, junr., Lyndhurst	1	1	Jersey	Lady Monica 22nd of King's Vale	Jr. 2 yrs.	21086	1.1.28	273	14	5,967	4·68	279·23	200	
Mrs. Archibald and Sons, Elmore	1	1	Jersey	Lady Monica 2nd of Mayfield Park	Sr. 2 yrs.	21093	19.3.28	273	..	4,787	5·38	257·58	225	
W. H. Atherton, Murraydale	2	2	Jersey	Quality of Meadowvale ..	Mature	10133	2.2.28	273	19	6,806	5·65	384·27	350	293, 346, 375, 400, 416
				Wattle Bloom of Beverley ..	Sr. 3 yrs.	18611	15.2.28	273	13	6,530	5·25	342·73	275	329

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
W. K. Atkinson, Swan Hill	10	6	Milking Shorthorn	Carnation of Willow Park ..	Sr. 3 yrs.	13226	10.1.28	273	..	6,661	4·10	273·34	275	259, 266
				Duchess 5th of Willow Park	Jr. 4 yrs.	13495	14.1.28	273	..	7,536	4·07	307·05	300	259, 264
				Camelia 2nd of Willow Park	Jr. 3 yrs.	..	16.1.28	273	..	7,751	3·71	287·53	250	
				Dulcie of Wilow Park ..	Jr. 4 yrs.	13500	17.1.28	273	..	7,050	3·89	274·43	300	270, 307
				Fairy 2nd of Willow Park ..	Jr. 4 yrs.	..	27.1.28	273	..	11,877	4·26	506·04	300	382
				Blush of Willow Park ..	Mature	11069	1.2.28	273	..	10,320	3·85	397·73	350	320, 368, 478, 494, 565, 515
				Moss Rose of Willow Park ..	Sr. 4 yrs.	14221	6.2.28	273	..	11,381	4.14	470·73	325	404, 424
				Queenie 9th of Willow Park ..	Sr. 3 yrs.	..	18.2.28	273	15½	5,822	4·14	240·80	275	220
				Princess 4th of Willow Park	Jr. 4 yrs.	14450	2.3.28	273	7	5,454	4·40	240·03	300	288, 191
				Chance of Willow Park ..	Sr. 4 yrs.	13259	25.3.28	273	27½	7,960	4·37	348·24	325	292. 294
F. Austin, Lara	2	2	Jersey	Bolinda's Handsome Girl of Linga Longa	Jr. 4 yrs.	16598	9.3.28	273	12	5,139	7·22	371·10	300	249, 276
				Avalon Mercede's Belle 4th ..	Jr. 2 yrs.	22935.	23.3.28	273	18	5,525	4·79	264·40	200	
Aveley Stud Farm Pty. Ltd., Whittlesea	1	1	Jersey	Trinket of Aveley	Sr. 4 yrs.	17788	30.12.27	273	33	6,933	5·46	378·48	325	249, 278
Mrs. A. J. Black, Mt. Noorat	4	3	Jersey	Noorat Garenne	Sr. 2 yrs.	22985	9.3.28	273	10½	4,899	5·02	246·15	225	
				Cello 2nd of Warenda ..	Jr. 4 yrs.	17699	16.3.28	273	22½	9,133	4·83	440·95	300	268
				Noorat Sunflower	Sr. 3 yrs.	21135	18.3.28	150	15	4,590	4·78	219·56	275	292
				Noorat Melody	Sr. 2 yrs.	22989	27.3.28	273	15½	7,074	5·63	398·34	225	
I. S. Black, Mt. Noorat	2	1	Ayrshire	Maisie of Sparrovale ..	Mature	3901	1.1.28	273	15	8,525	3·96	337·40	350	284, 342, 351, 287, 275, 266
				Sparrovale Ailsa Craig ..	Jr. 2 yrs.	16632	8.3.28	273	20	5,987	4·27	255·61	200	

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
S. Bolton, Mannerim	1	1	Jersey	Noble Guitar 3rd of Banyule..	Jr. 2 yrs.	18810	30.12.27	273	16	4,338	5·99	259·66	200	
A. A. Broad, Sutton Grange	2	2	Jersey	Dainty of Grangelea ..	Mature	15453	3.1.28	273	24½	8,107	5·58	452·22	350	296, 403, 392
				Machree of Banyule ..	Mature	9490	11.3.28	273	19½	6,862	5·79	397·62	350	277, 300, 410, 436, 443
Cameron and Smith, Orbost	2	2	Red Poll	Victoria Aroma	Jr. 2 yrs.	..	16.2.28	273	12	4,862	4·73	229·97	200	
				Victoria Bel Tamo	Sr. 3 yrs.	1148	17.2.28	273	24	7,802	4·48	349·26	275	336
D. Cameron and Son, Valencia Creek	4	4	Jersey	Werribee Wyandotte Cream	Mature	12244	8.1.28	273	25	7,737	5·27	407·86	350	334, 475, 559, 558, 442
				Dianthus of Springhurst ..	Mature	12215	13.1.28	273	22½	7,408	6·18	457·94	350	274, 393, 380, 439, 456
				Studleigh Dianthus ..	Sr. 2 yrs.	21159	20.2.28	273	22	7,415	5·90	437·40	225	347
				Studleigh Empire	Jr. 3 yrs.	19878	16.3.28	273	10	3,824	6·61	252·93	250	209
W. C. Cayley, Werribee	2	1	Ayrshire	Sparrovale Trefoil	Jr. 3 yrs.	16706	29.1.28	273	19½	7,670	4·36	334·73	250	288
				Miss Prim of Riversdale ..	Mature	13306	1.2.28	273	13	6,590	4·25	280·39	350	227, 264
J. Clyne, Upper Maffra West	2	2	Jersey	Cora 2nd of Elouera ..	Mature	13394	4.1.28	273	26	8,150	5·08	413·78	350	285, 416, 425
				Fortywinks of Paisley ..	Sr. 3 yrs.	17721	23.1.28	273	17	5,408	5·86	316·80	275	
W. and J. Cockbill, Rockbank	1	1	Ayrshire	Fulham Vista	Jr. 2 yrs.	14649	3.2.28	273	15	5,425	4·65	252·05	200	

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
J.A.A. Coombes, Tongala	1	..	Jersey	White Socks of The Valley ..	Jr. 4 yrs.	21207	18.1.28	273	13	4,892	5·55	271·29	300	
J. Cook, Toora	1	1	Jersey	Pretty Lady of Whare Koa ..	Mature	14143	4.2.28	273	25	7,131	5·88	419·26	350	345, 337
J. Dee, Nth. Clyde	1	1	Jersey	Lady Jewel of Elouera ..	Mature	13782	5.2.28	273	29	9,431	4·34	409·72	350	
Department of Agriculture, Burnley H.S.	1	..	Jersey	Yarra Brae Flash	Mature	Vol. 16	11.3.28	273	4½	3,447	6·20	213·86	350	357, 199
Department of Agriculture, Werribee	1	1	Friesian	Victoria Patchwork ..	Jr. 4 yrs.	1706	10.2.28	273	31½	13,875	3·81	528·37	300	304, 273
Department of Agriculture, Werribee	15	7	Red Poll	Victoria La Regal	Mature	718A	30.12.27	273	34	11,955	3·66	437·42	350	320
				Victoria Bellbird	Mature	714A	15.1.28	273	..	8,214	5·14	421·95	350	337, 338
				Victoria Rose Regal ..	Mature	560AA	16.1.28	273	17	7,194	3·86	277·74	350	181, 306
				Victoria Magnolia	Mature	1246B	17.1.28	240	20	6,600	4·46	294·35	350	330, 395
				Victoria Cutty Sulu ..	Sr. 4 yrs.	1284C	28.1.28	273	30	8,514	4·53	385·45	325	319, 428
				Victoria Cutty Socks ..	Jr. 2 yrs.	..	2.2.28	273	..	5,476	4·15	227·17	200	
				Flowing Vale Zorah ..	Mature	..	3.2.28	273	15½	6,126	4·12	252·42	350	411
				Victoria Cutty Belle ..	Sr. 3 yrs.	1283C	4.2.28	240	26	8,115	4·25	345·27	275	296
				Beltana	Mature	239A	9.2.28	273	13½	8,637	3·42	295·70	350	269, 325, 346, 380
				Ornitha	Mature	313B	13.2.28	273	22	7,355	4·59	337·75	350	208, 247, 328, 256, 311, 359, 366
				Gelderlana A	Mature	387C	3.3.28	273	27½	10,901	3·74	408·16	350	281, 366
				Victoria Badge	Sr. 4 yrs.	1143A	6.3.28	273	16	6,440	4·74½	304·95	325	264
				Victoria Stripe	Mature	723A	18.3.28	273	24½	8,918	3·92	349·86	350	295, 223, 296
				Victoria Crater	Sr. 3 yrs.	1752B	20.3.28	273	..	6,458	4·21½	271·98	275	244
				Victoria Bright Eye ..	Mature	788B	27.3.28	273	23½	8,877	5·25	465·90	350	351, 446

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
Dookie Agricultural College	1	..	Ayrshire	Dookie Pretty	Sr. 4 yrs.	14718	5.3.28	180	4	3,240	4·58	148·40	325	187, 295
P. J. Ducat, Ardmona	3	2	Jersey	Airlie Nita	Sr. 4 yrs.	Vol. 16	30.12.27	180	4	3,435	5·05	173·60	325	
				Mardi of Airlie	Sr. 3 yrs.	18698	6.3.28	273	20½	7,463	4·98	371·99	275	
				Gold Drop of Brookside ..	Mature	9366	7.3.28	273	27½	8,297	4·76	395·34	350	
G. Dwyer, Balwyn	1	..	Jersey	Shorcham Linda	Jr. 2 yrs.	23117	7.3.28	273	10	3,000	6·47	194·11	200	
A. Ellis, Archie's Creek	3	3	Jersey	Pearl of Hollbrook	Mature	15473	5.2.28	273	25½	7,110	5·21	370·24	350	329, 331
				Startle of Woorayl	Mature	14938	2.3.28	273	21	6,990	5·96	416·77	350	290, 367
				Pearl of Blackwood Grove ..	Jr. 3 yrs.	21264	10.3.28	273	20½	6,722	5·39	362·21	250	296
N. Enders, Stanhope	2	2	Jersey	Princess of the Wattles ..	Jr. 2 yrs.	21265	14.1.28	273	10	4,860	5·89	286·18	200	271
				The Wattles Pearl	Jr. 2 yrs.	23215	25.1.28	273	14½	6,405	5·28	338·40	200	
A. T. N. Facey, Glen Forbes	1	..	Ayrshire	Springburn Queenie ..	Jr. 4 yrs.	12399	31.12.27	150	19	3720	3·39	148·40	300	
T. R. Findlay, Leitchville	2	1	Jersey	Twylish Countess of Leven Brae	Sr. 4 yrs.	16641	16.1.28	273	13	6,759	4·76	321·63	325	215, 317, 299
				Perree's Capture of Leven Brae	Sr. 4 yrs.	16265	27.3.28	273	20½	7,293	5·04	367·42	325	217, 333
W. Fixter and Son, Boisdale	2	1	Jersey	Music of Olivedale	Sr. 3 yrs.	21281	5.1.28	180	4	2,993	4·80	143·63	275	208
				Queenie of Riversdale ..	Mature	12922	16.2.28	273	14½	7,130	5·31	378·64	350	246, 325, 367

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
Foster Bros., Boisdale	3	2	Jersey	Lady Marge 9th of Jerseyholme	Jr. 2 yrs.	21329	17.3.28	273	10¼	3,345	5·41	180·88	200	
				Nightshade 2nd of Springhurst	Mature	14255	25.3.28	273	18	7,403	6·34	469·52	350	333, 394, 417
				Linda 72nd of King's Vale ..	Jr. 2 yrs.	21089	29.3.28	273	12	4,515	4·90	221·36	200	
G. Gange, Mininera	1	1	Ayrshire	Baronia of Roseleigh ..	Mature	12106	31.1.28	273	12	9,004	4·09	368·71	350	283, 356, 335
N. Gange, Berrybank	5	4	Ayrshire	River Glen Fuchsia.. ..	Sr. 4 yrs.	14812	24.3.28	273	14	8,538	4·18	357·50	325	
				River Glen Bellona ..	Sr. 4 yrs.	14805	27.3.28	273	19	8,363	3·91	333·14	325	
				Balm 5th of Carracoorte ..	Mature	9307	28.3.28	273	12	9,407	3·80	357·69	350	333, 375, 383
				River Glen Bunty	Sr. 3 yrs.	14809	28.3.28	273	7	6,437	4·62	297·41	275	263
				River Glen Bonnie	Jr. 2 yrs.	16564	29.3.28	273	6	4,572	4·35	199·12	200	
O. Gepp, Macleod	1	1	Jersey	Maid 3rd of Linden.. ..	Mature	10608	6.1.28	273	..	7,205	5.87	422·87	350	265, 358, 404, 513, 412
Gibson Bros., Trafalgar	1	1	Jersey	Pansy 4th of Ferntree Vale ..	Mature	9377	12.3.28	273	16	6,971	5·63	392·23	350	408, 482, 452, 520, 484
A. W. Gorman, Alexandra	1	1	Ayrshire	Cathcart Blanche	Jr. 3 yrs.	14839	27.3.28	273	13	5,889	4·48	263·98	250	225
J. E. Gunningham, Tahara Bridge	1	1	Jersey	Noble's Choice of Brookside ..	Sr. 4 yrs.	17431	7.2.28	273	13½	5,246	6·63	347·99	325	
E. Hall, Tongala	1	1	Jersey	Violet of Melwood	Sr. 2 yrs.	21308	27.3.28	273	15	4,740	5·59	264·88	225	247

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
D. Harker, Caldermeade	2	2	Ayrshire	Petals of Rankeillor ..	Mature	9218	2.1.28	273	23	8,457	4·76	402·51	350	329
				Sunbeam of Thirlmere ..	Jr. 2 yrs.	14897	8.2.28	273	19½	4,685	4·61	216·20	200	
W. Harker, Caldermeade	1	1	Ayrshire	Tinkle of Wayside	Jr. 2 yrs.	14908	5.3.28	273	21½	5,813	4·86	282·48	200	
T. Harvey, Boisdale	4	4	Jersey	Daisy 6th of Jerseyholm ..	Mature	5917	18.2.28	273	21	9,116	4·78	435·73	350	332, 415, 373, 392, 419, 436, 464, 380
				Empress 3rd of Jerseyholm ..	Mature	10255	19.2.28	273	19½	8,615	5·50	473·94	350	396, 391, 478, 497
				Empress 5th of Jerseyholm ..	Sr. 3 yrs.	16650	8.3.28	273	15½	6,528	6·45	421·31	275	363
				Empress 9th of Jerseyholm ..	Jr. 2 yrs.	21328	15.3.28	273	13	4,728	6·96	329·01	200	
W. Henderson, Grasmere Home Farm	2	2	Ayrshire	Sparrovale Buttercup ..	Jr. 2 yrs.	16646	11.2.28	273	17	5,766	4·67	269·44	200	
				Sparrovale Lavender ..	Jr. 2 yrs.	16670	21.2.28	273	15	8,325	4·20	349·41	200	
A. J. Hitchins, Werribee	1	..	Jersey	Laane Fontaine	Mature	14999	28.2.28	273	23½	6,508	4·71	306·27	350	
E. H. Howlett, Morwell	2	2	Jersey	Stella 3rd of Latrobe ..	Sr. 2 yrs.	21354	3.2.28	273	21	5,645	5·81	328·04	225	
				Andante of Banyule ..	Jr. 3 yrs.	16686	1.3.28	273	18½	6,023	5·68	342·04	250	252
A. Hubbard, Yarra Glen	3	1	Ayrshire	Mernda of Burnside ..	Mature	11092	14.2.28	273	5½	5,988	4·67	279·56	350	
				Lovely 2nd of Homeleigh ..	Mature	6398	14.3.28	273	14	6,669	4·69	312·48	350	
				Emoh Ruo Sweet Maid ..	Jr. 2 yrs.	14948	18.3.28	273	12	6,896	4·12	284·46	200	

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
G. A. Kent, Archie's Creek	3	2	Ayrshire	Merry of Woolamai Park ..	Sr. 4 yrs.	12357	3.3.28	273	21	7,677	5·24	402·13	325	265, 228
				Pet of Woolamai Park ..	Jr. 4 yrs.	12358	3.3.28	273	17	7,913	4·22	333·69	300	264, 265
				Blossom of Woolamai Park ..	Mature	11153	4.3.28	273	13	7,299	4·59	334·99	350	282, 312, 297
Agricultural College, Longerenong	3	1	Ayrshire	Longerenong Tecoma ..	Jr. 3 yrs.	15053	21.2.28	273	5	3,437	5·84	200·61	250	230
				Longerenong Mermin ..	Sr. 2 yrs.	15050	13.3.28	273	13	5,646	4·54	256·53	225	
				Banksia of Longerenong ..	Mature	12431	1.4.28	240	4	5,880	3·83	225·37	350	283, 276, 313
Mrs. L. Lowing, Tongala	4	1	Jersey	Glenflorrie	Mature	12934	20.1.28	273	27	7,005	4·99	349·20	350	334
				Glenrosy	Mature	12937	20.1.28	273	21	6,033	5·33	321·40	350	330
				Roseleaf of Cooel	Jr. 4 yrs.	16350	16.2.28	273	16½	4,375	5·60	245·14	300	203
				Lorna of Hillcrest	Mature	9435	18.3.28	273	29	8,916	4·19	373·78	350	355
C. G. Lyon, Heidelberg	9	9	Jersey	Aria of Banyule	Jr. 2 yrs.	18802	29.12.27	273	23	7,076	5·21	368·46	200	
				Silvermine 30th of Banyule ..	Jr. 4 yrs.	14196	13.1.28	273	15	7,028	4·76	334·35	300	310, 315
				Molly 22nd of Banyule ..	Jr. 2 yrs.	18809	3.2.28	273	16½	5,041	5·98	301·31	200	
				Silvermine 38th of Banyule..	Jr. 2 yrs.	18817	23.2.28	273	17½	5,285	5·87	310·16	200	
				Hawthorn 10th of Banyule ..	Mature	11,584	28.2.28	273	16½	7,592	5·99	455·06	350	330, 524
				Silvermine 40th of Banyule ..	Jr. 2 yrs.	18819	1.3.28	273	17	6,174	5·37	331·26	200	
				Crescendo of Banyule ..	Mature	14181	6.3.28	273	17½	8,231	5·59	460·07	350	329, 448
				Silvermine 28th of Banyule ..	Mature	11604	12.3.28	273	17	7,460	5·08	379·04	350	348, 446, 321
				Molly 8th of Banyule ..	Mature	9499	21.3.28	273	25½	10,532	5·29	357·59	350	304, 453, 538, 637, 605, 556
C. W. W. Macauley, Rochester	1	1	Jersey	Ruby of Taranah	Jr. 2 yrs.	..	16.3.28	273	9½	4,080	5·42	221·07	200	

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
Miss C. E. McClelland, Tunstall	1	1	Jersey	Peggy of the Elms	Sr. 3 yrs.	21446	29.2.28	273	19	6,332	4·95	313·42	275	237
J. McDougall, Byaduk	1	1	Jersey	Flora of Park View ..	Jr. 3 yrs.	18826	20.3.28	273	21	7,979	5·44	433·92	350	338
H. V. MacLeod, Tyrendarra	1	1	Jersey	Cora 2nd of Kameruka ..	Mature	10337	22.1.28	210†	20½	6,090	6·00	365·21	350	571
G. A. McNabb and Son, Irrewillipe East	3	3	Jersey	Easter Daisy of Springhurst	Sr. 2 yrs.	21607	11.1.28	273	21	6,695	4·38	293·12	225	
				Mendip Vanilla 2nd ..	Jr. 2 yrs.	23465	17.1.28	273	16	5,416	5·19	280·97	200	
				Trefoil 4th of Springhurst ..	Sr. 3 yrs.	16972	2.3.28	273	22	6,617	4·53	299·55	275	299
Mesdames McWhae and Silvester, Merino	6	6	Guernsey	Minnamurra Sunbeam ..	Sr. 4 yrs.	1234	15.1.28	273	27	8,435	4·54	383·02	325	
				Minnamurra Rosemary ..	Sr. 2 yrs.	..	22.2.28	273	24½	7,428	5·56	413·25	225	
				Yarra View Meadow Sweet ..	Sr. 3 yrs.	1269	27.2.28	273	4	5,742	4·99	286·80	275	208
				Woolongbar Princess May 6th	Sr. 2 yrs.	..	3.3.28	273	24	8,007	5·17	413·72	225	
				Yarra View Maud	Jr. 3 yrs.	1268	10.3.28	273	12	5,417	6·11	331·23	250	296
				Wollongbar Bel Air 15th ..	Jr. 2 yrs.	..	27.3.28	273	10	5,183	4·72	244·79	200	
R. Maher, Tongala	1	1	Jersey	Silvermine 39th of Banyule ..	Jr. 2 yrs.	18818	25.2.28	273	21	8,144	5·27	429·19	200	
Maher Bros., Seymour	1	1	Ayrshire	Carlisle of Evelyn	Sr. 3 yrs.	13849	13.3.28	273	19	7,197	4·30	309·47	275	
P. J. Maloney, Tongala	1	1	Jersey	Werribee Fancy Clementine ..	Mature	9256	6.1.28	273	22½	8,827	5·29	466·88	350	

† Sold before completion of term.

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
A. J. Mapleson, Jindivick	1	1	Jersey	Purity's Last Edition of Hazeldale	Mature	13757	20.1.28	240	21½	6,960	5·47	380·52	350	
E. Nicholls, Springhurst	2	2	Jersey	Beckie 2nd of Blowering ..	Sr. 3 yrs.	18875	19.3.28	240	18	5,385	5·55	298·92	275	
				Pearl of Blowering	Sr. 2 yrs.	21539	20.3.28	240	12	6,255	4.84	303·07	225	
B. R. O'Meara, Caldermeade	2	..	Ayrshire	Scotswood Modesty ..	Sr. 3 yrs.	15490	23.1.28	273	8	6,251	4·01	250·84	275	232
				Scotswood Sylvia	Mature	10321	26.1.28	273	19½	8,354	4·15	346·99	350	213, 194, 292, 201
W. H. Cnley, Caldermeade	1	..	Ayrshire	Ida of Kelvin Grove ..	Sr. 4 yrs.	11539	14.3.28	273	12	8,330	3·12	260·23	325	251
Mrs. A. C. Overend, Sale	3	3	Jersey	Sparkle 10th of Jerseyholm ..	Sr. 3 yrs.	18774	16.2.28	273	18½	7,147	5.38	384·33	275	316
				Sparkle 9th of Jerseyholm ..	Sr. 3 yrs.	13358	6.3.28	273	17½	6,424	6·35	408·08	275	307
				Peggy of Bon Accord ..	Jr. 2 yrs.	21545	23.3.28	273	1[illegible]½	5,805	6·08	352·85	200	260
W. Parbury, Warburton	7	3	Jersey	Rosebud 7th of Brookfield ..	Sr. 2 yrs.	18894	30.12.27	273	10	3,717	5·79	215·37	225	
				Nancy Rosalind of Brookfield	Mature	18509	21.2.28	273	4	6,219	4·86	302·34	350	348, 336
				Beauty 6th of Brookfield ..	Sr. 4 yrs.	15583	22.2.28	273	26	8,123	3·96	321·37	325	267
				Sunshine 7th of Brookfield ..	Jr. 3 yrs.	18898	6.3.28	273	11	5,447	4·72	257·24	250	195
				Rosebud 6th of Brookfield ..	Jr. 3 yrs.	18893	16.3.28	273	13	4,379	5·13	224·56	250	228
				Verbena 9th of Brookfield ..	Sr. 2 yrs.	18902	25.3.28	273	20	5,575	5·52	307·76	225	232
				Verbena 8th of Brookfield ..	Jr. 3 yrs.	18901	27.3.28	273	20	5,616	5·34	299·67	250	332
J. Phillips, Murraydale	1	1	Jersey	Peri Empire 2nd	Jr. 2 yrs.	23362	16.3.28	273	15½	4,638	5·73	265·59	200	

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.			lb.	
J. Plattfuss, Tongala	5	4	Friesian	Hill View Countess Oakwood	Sr. 2 yrs.	2202	29.12.27	273	20	6,765	3·02	204·44	225	
				Greenvale Juno Rose 2nd ..	Sr. 4 yrs.	1570	13.1.28	273	40	14,873	3·18	472·82	325	349, 544
				Glen Elgin Jessie Segis ..	Jr. 2 yrs.	C.R.	29.2.28	273	38½	10,286	3·31	340·61	200	
				Riverbank Ideal Ashlyn ..	Jr. 2 yrs.	2242	3.3.28	273	29½	8,321	3·48	289·68	200	
				Greenvale Duchess Paxton ..	Jr. 2 yrs.	2768	11.3.28	273	30	9,662	3·37	325·28	200	
Mrs. M. A. Poole, Caldermeade	1	1	Ayrshire	Bush Bank Fairy	Jr. 2 yrs.	15804	1.2.28	273	16½	4,704	4·64	218·41	200	
F. Raggatt, Tongala	1	1	Jersey	Goldy of Strathbow ..	Mature	9645	26.3.28	273	..	9,579	5·76	552·17	350	318, 394, 443, 574, 669, 612
Miss H. E. Raleigh, Pakenham Upper	1	1	Jersey	Goronga Farm Daffodil Tertia	Jr. 2 yrs.	24559	21.1.28	273	11½	4,913	5·61	275·60	200	
J. D. Read, Springhurst	4	4	Jersey	Gladiolus of Springhurst ..	Mature	12216	1.2.28	273	24½	8,370	5·30	443·21	350	341, 479, 542, 547
				Boree 2nd of Springhurst ..	Sr. 4 yrs.	14238	23.3.28	273	24½	9,014	5·41	488·02	325	348, 435, 283
				Gladiolus 2nd of Springhurst	Sr. 3 yrs.	18929	23.3.28	273	21	7,863	6·19	486·99	275	401
				Tulip 2nd of Springhrust ..	Mature	9667	24.3.28	273	24	10,110	5·08	513·17	350	316, 278, 517, 438, 584, 462
W. A. Regnier, Poowong	2	..	Friesian	Clover Hill Southern Maid ..	Mature	App. 4	1.1.28	273	12	5,025	3·88	194·82	350	214
				St. Alban's Helen	Mature	367	9.3.28	273	13	5,888	3·14	185·03	350	201
W. S. Richardson, Riddell	2	1	Jersey	Sutton Lea Latricia ..	Sr. 2 yrs.	23395	29.1.28	273	10	3,521	5·54	194·98	225	235
				Sutton Lea Midget	Sr. 3 yrs.	19947	17.2.28	273	22	7,198	5·09	366·20	275	312

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
Miss S. L. Robinson, East Kew	2	2	Jersey	Kyora Sultan's Adore 2nd ..	Jr. 2 yrs.	23408	4.1.28	273	20	6,480	5·61	363·75	200	
				Kyora's Mayflower 4th ..	Sr. 2 yrs.	Vol. 16	12.3.28	240	21	6,465	4·86	314·04	225	
C. N. Runciman, Murraydale	3	3	Jersey	Lea Hurst Silk Stockings 4th	Jr. 2 yrs.	23429	22.3.28	273	..	4,982	5·49	273·40	200	
				Magnolia Wyandotte of Lea Hurst	Jr. 2 yrs.	21644	23.3.28	273	..	4,463	5·12	228·59	200	183
				Maudie of Greenwood ..	Sr. 3 yrs.	16712	25.3.28	273	..	7,143	5·31	379·48	275	278
A. H. Schier, Kernot	13	1	Ayrshire	Scotswood Merline	Sr. 4 yrs.	15487	12.1.28	273	6	4,804	5·19	249·18	325	221, 191, 153
				Scotswood Maybelle ..	Sr. 4 yrs.	15486	22.1.28	273	7½	2,840	4·16	118·15	325	92
				Scotswood Melody	Jr. 2 yrs.	16621	28.1.28	273	14½	3,735	4·74	176·88	200	
				Scotswood Maid	Jr. 2 yrs.	16615	29.1.28	273	15½	4,713	4·51	212·74	200	
				Scotswood Sylvia 2nd ..	Jr. 2 yrs.	16630	9.2.28	273	13	3,615	4·72	170·74	200	
				Bettsie of Inverleigh ..	Mature	10285	16.2.28	273	10½	5,192	4·32	224·05	350	213, 242, 191, 290, 312, 240
				Scotswood Better Still ..	Jr. 3 yrs.	15470	17.2.28	273	4½	4,244	3·76	159·46	250	178
				Scotswood Maimie's Mischief	Sr. 2 yrs.	15483	25.2.28	273	4	2,847	4·50	128·24	225	169
				Scotswood Model	Mature	14155	27.2.28	273	4	4,538	3·89	176·40	350	275, 212, 194
				Myrtle 2nd of Pine Grove ..	Mature	4637	28.2.28	273	11½	6,518	3·85	251·07	350	282, 264, 298, 308, 335, 364, 375, 255
				Scotswood Dainty	Jr. 4 yrs.	15475	4.3.28	273	4	4,058	4·70	190·86	300	191, 126
				Scotswood Bonnie	Jr. 4 yrs.	16604	6.3.28	273	13	5,190	4·71	244·53	300	64, 231
				Scotswood Boronia ..	Mature	15472	9.3.28	273	6½	4,188	4·97	208·34	350	202, 242
H. A. Schier, Rochester	1	1	Jersey	Ruby of Taff Vale	Jr. 4 yrs.	17832	4.2.28	240	14½	5,805	5·29	307·08	300	353
C. H. Sell, Irrewillipe East	1	1	Jersey	Mendip Pearl 3rd	Jr. 2 yrs.	23464	24.1.28	273	13	5,075	5·89	298·80	200	

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
C. L. V. Sharp, Murrabit	1	..	Friesian	Burnbank de Kol Kroons ..	Jr. 3 yrs.	2119	2.1.28	273	lb. 26½	lb. 7,295	3·31	lb. 241·41	lb. 250	170
Smith and Sons, Woodend	2	2	Friesian	Cottoslee Wooderest Maid ..	Sr. 3 yrs.	2411	4.1.28	273	21	7,812	4·21	328·94	275	
				Halecote Oakleaf Fobes ..	Mature	600	9.1.28	273	55	19,026	3·56	676·77	350	299, 466, 642, 693, 585
O. J. Syme, Macedon	1	1	Friesian	Springfield No. 9	Mature	1071	28.12.27	273	21	17,435	3·47	605·06	350	357, 487, 575, 598
J. T. Tweddle, Clyde	2	..	Friesian	Burnbank Dutch Princess ..	Mature	1518	17.1.28	210	4	4,290	3·58	153·40	350	
				Winlaton Pietje Bainfield ..	Sr. 2 yr.	2972	23.3.28	210	16	3,580	3·03	108·83	225	243, 284, 287, 212
J. T. Tweddle, Sunbury	4	4	Friesian	Winlaton Secret Princess ..	Mature	2076	7.3.28	273	19½	10,790	3·30	355·73	350	360, 294
				Burnbank Canary Patch ..	Mature	1516	9.3.28	273	25½	11,052	3·75	414·95	350	356, 314
				Winlaton Magpie	Jr. 2 yrs.	2971	16.3.28	273	26	9,359	3·42	326·84	200	
				Winlaton Lassie Patch ..	Jr. 2 yrs.	2970	18.3.28	273	19	9,435	3·43	323·35	200	
A. Wallace, Bendigo	1	1	Ayrshire	Idol of Springvdale ..	Jr. 3 yrs.	14276	24.3.28	273	27½	8,615	3·71	319·67	250	234
H. Webb, Sunbury	2	1	Ayrshire	Romance of Holly Green ..	Jr. 3 y s.	14281	23.1.28	273	17	7,524	3·83	288·33	250	232
				Quality of Holly Green ..	Jr. 4 yrs.	12926	22.3.28	273	11½	5,454	4·82	262·90	300	256
S. K. Webb, Neerim North	1	1	Jersey	Pearl 13th of Melrose ..	Mature	15050	28.3.28	273	..	6,441	5·58	359·32	350	320, 397, 329
W. O. Westlake, Portland	1	1	Jersey	Cloverfield Merle	Jr. 2 yrs.	2.517	23.1.28	273	23	5,919	5·32	314·62	100	

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
R. S. Williams, Kongwak	1	1	Jersey	Linga Longa Colleen ..	Sr. 2 yrs.	Vol. 16	1.2.28	273	20	5,296	5·72	302·77	225	
W. Woodmason, Oakleigh	4	3	Jersey	Jessie 36th of Melrose ..	Mature	19035	20.1.28	273	15	5,958	5·71	340·09	350	269
				Vanilla 11th of Melrose ..	Mature	7550	3.2.28	273	13½	6,975	5·30	369·35	350	303, 362, 369, 424, 329, 419, 376, 418, 404
				Jessie 44th of Melrose ..	Jr. 3 yrs.	19977	7.2.28	273	15	5,167	5·83	301·06	250	262
				Graceful Duchess 19th of Melrose	Mature	7540	18.3.28	273	19	6,347	6·22	394·89	350	325, 404, 438, 433, 466, 360, 486, 459

THE MARKETING OF EGGS.

W. C. Rugg, Chief Poultry Expert.

The egg market is, and has been for some weeks, in a deplorable condition. Producers and merchants are passing through a very anxious and unprofitable time. This state of affairs is the result of the tremendous increase in the production of eggs that has taken place during the last three to four years, and particularly during the last twelve months.

This increase has been general all over the State, but it will be possible to get accurate figures only when the census is taken next year. It is known that some of the large poultry farms operating within a radius of 20 miles of Melbourne have nearly doubled the number of birds carried by them. Some of them now have from 5,000 to 30,000 laying hens. Nearly the whole of the eggs produced on these farms are delivered direct to customers by motor, so it is impossible to state even the approximate number. Some indications of the growth of egg production is given, however, by the comparative figures published by the Railway Department. During the twelve months ended 31st December, 1927, 7,059¾ tons of eggs arrived in Melbourne by rail; for the twelve months ended 31st December, 1928, the quantity was 8,302½ tons—an increase of 1,242¾ tons from country districts alone. In some quarters there is wild talk about over-production, and that the industry is ruined. There are rumours of appeals to the Government for assistance in the way of bounties, egg pools, or subsidies, to help the poultry man out of his difficulties.

Not Over-Production, but Under-Consumption.

I do not believe that any of these remedies is necessary. It is my considered opinion that, if the marketing of eggs is put on a proper footing, Victoria's population could and would consume double the quantity of eggs that are now being produced. The trouble with the egg business to-day is not over-production, but under-consumption.

All the men engaged in the business know that it is the large number of inferior or poor quality eggs that have been allowed to go on to the market that has destroyed the confidence of the consumer, has restricted sales, and depreciated prices. The first essential in the successful marketing of any commodity is quality, and any neglect in this direction immediately results in low prices and restricted sales.

Quality Must be Guaranteed.

In Victoria almost every food used by human beings is controlled by the Pure Foods Act. Every retailer of foodstuffs is liable to prosecution if the article he sells does not comply with the legal standard of weight and quality laid down for the particular article, with one exception—that is eggs. I am informed that if a grocer sells soap that does not comply with certain standards, he is liable

to prosecutions; yet that same grocer can, if he wishes, fill his window with eggs, large and small, dirty-shelled and clean, stale and new-laid, all mixed together, and sell them over the counter without any restrictions whatever. For this state of affairs grocers and retailers are not altogether responsible; they have not the time to candle, grade, and clean dirty eggs; their business is to dispose of a perishable article in as short a time as possible. The preparation of eggs for market is, logically, the producers' duty, but is too often neglected by him.

For many years efforts have been made by poultry organizations, the press, and the officers of the Department of Agriculture, to impress upon producers the vital importance of this, and it has resulted in some improvement, but there is still a large army of careless producers, and no amount of persuasion can make them realize the harm they are doing, not only to themselves, but to the whole industry.

I am convinced that if standards were to be laid down by which all eggs would be sold by quality and weight, an increase in consumption would result, leading to better prices, and consequent prosperity to the industry.

Grading of Eggs in Other Countries.

The compulsory grading of eggs and their sale by weight standards is not new. It has been in force in Canada for ten years, and in Northern Ireland for the last five years, and it has just been made law in England. In both Canada and Northern Ireland the introduction of the scheme was immediately followed by an enormous increase in consumption which led to increased production and general prosperity in the industry; and it was because of the success of the innovation in these countries that the British Government brought down legislation which came into operation only this month.

It was stated in the report of the Imperial Economic Committee appointed by the British Government to inquire into the marketing of eggs, that according to evidence given before the Commission, the scheme by which eggs were sold in Canada on a quality and weight basis, increased the consumption of eggs in the five years from 1921 to 1926 by 135 eggs per head for every man, woman, and child. If half that increase in consumption were to take place in Victoria it would require a great many more producers than are in the business to-day to supply the eggs. To put it in another way, what we might call the "visible" surplus of eggs produced in Victoria up to February this year was approximately 2,645,295 dozens; of these 715,620 dozen were exported, and 1,929,675 dozen placed in cool store.

If the consumption of eggs in Victoria was increased by only two dozen per person per year, it would dispose of 3,436,000 dozen, which is over 790,000 dozen more than the total which last year was exported and placed in cool store.

As the Canadian population increased its consumption by eleven and one-third dozens per head, surely it is possible for the consumption in Victoria to be increased by two dozen per head, or one egg a fortnight. However, I am satisfied that to achieve this, some

standard must be adopted by which eggs will be sold according to quality and weight, and regulations must be framed compelling sellers to clearly indicate whether eggs are chilled or fresh.

The fact that eggs next to milk are the most delicate and most nourishing concentrated food is so well known that they need no recommendation by me. It is only because they are almost indispensable to the average housewife that this unorganized, unadvertised industry is as important as it is to-day. A campaign at the right time to increase the consumption of eggs will not only benefit the poultry industry, but will improve the health of the people generally. But any effort will be wasted unless the poultry men can guarantee the quality of the article he is selling. When he can do this, he will be in a wonderful position to launch his campaign, because he has an article to sell that it is not possible to adulterate, and which is already almost a necessity in the majority of households.

SWISS DAIRYING INDUSTRY.

According to information released by the special statistical committee of the Swiss Milk Commissioners, Swiss milk production is utilized as follows:—

Form of Utilization.	Percentage.		
	1924.	1925.	1926.
On Farms	31·6	31·3	32·0
As Fresh Milk	27·4	27·2	25·4
Cheese Factories	35·7	37·0	37·8
Condenseries	3·5	3·8	4·2
Exported—fresh state ..	1·8	0·7	0·6

Less than one-half of the total Swiss production of Swiss milk manufactures is exported. During the year 1926, 40 per cent. of the cheese production, less than 1 per cent. of the butter production, and 84 per cent. of the condensed milk production was exported.

During the world war the Swiss Government took part in the price control and distribution of the products of the Swiss dairy industry. To-day, however, the price which the milk producer receives in Switzerland is fixed relatively by the Central Union of Dairy Farmers through a guarantee of the price of cheese. In other words, the union guarantees to purchase the entire production of the cheese manufacturer at a fixed price. The cheese manufacturer, knowing that he will be able to dispose of his output at a specified price, is warranted in offering a certain price to the local central collection station, and thus to the producer. The price which the producer receives, therefore, varies only with respect to the cost of transportation to the cheese manufacturer. This variation is naturally small, for if no large cheese manufacturer is located in the immediate neighbourhood, the local central assumes the role of manufacturer.

This system of guaranteeing the price of milk through the price of cheese eliminates to a very large extent any tendency of other milk consuming industries to attempt to purchase at a price lower than the standard. If, for example, the condensed milk industry refuses to pay the standard price, the producers, through their local centrals, will turn their milk into cheese where the standard price can be obtained. If, on the other hand, the condensed milk industry is greatly in need of the milk, it may pay a premium in order to turn a greater quantity away from the cheese industry. The same situation is true in other milk consuming industries. Therefore, the producer is not bound by a fixed price; he is merely guaranteed a minimum price for his output. By guaranteeing the price of approximately one-third of the milk production the minimum price of the other two-thirds is automatically regulated inasmuch as the cheese industry is obliged to take care of any surplus production.

The producer makes no guarantee to supply fresh milk to the cheese, canned milk, and chocolate industries in the order of their relative importance. The Central Union of Dairy Farmers has assured the Government that a sufficient supply of fresh milk will be retained for domestic consumption. Aside from this agreement, which practically takes care of itself, the other milk consuming industries compete among themselves for the surplus, with the cheese producers bound by their agreement with the farmers to take all over-production.

The supply of milk for canning and confectionery is relatively stable, depending on the market demand for these products. The supply of milk for consumption as such is practically constant, with the cheese industry providing the ever-changing factor. If a shortage in the domestic fluid milk supply threatens, the Central Union of Dairy Farmers, through its organization, restricts fresh milk exportation in such amounts as may appear to be necessary.

Dairying is an important agricultural pursuit in Switzerland. There are approximately 875,000 cows in the country, and the domestic production of fresh milk for the first six months of the year is estimated at 1,500,000 short tons. It is claimed in some circles that there is an over-production of milk. In any case, as far as the canned milk industry is concerned, the supply of fresh milk would warrant considerable expansion.

Until the current year, powdered milk exports were included in the figures for canned milk. They now make up a separate category along with infants' food, special flours, &c., thus in part accounting for the reduced canned milk exports. The volume of powdered milk trade, however, is so small as to be without significance, now amounting, according to an export estimate, to only some $40,000 yearly.

An even half of the total Swiss canned milk exports during the period under review went to the Straits Settlements, Indo-China, the Dutch Indies, Burma, and Siam. About 30 per cent. of the total was credited to the Straits Settlements alone. England absorbed 17 per cent. of the total. Exports to France, about 6 per cent. of the total, amounted to $236,400.

There is no fixed export price, as competition and market conditions in various parts of the world necessitates some variation in the prices quoted different destinations. The following schedule may be considered as a basis as of 1st October, 1928:—

Unsweetened, in boxes of 48 cans of 16 oz., at factory, $5.21.

Sweetened, in boxes of 48 cans of 14 oz., at factory, $5.79.

The Swiss people are accustomed to fresh dairy products, and the supply of fresh milk is both plentiful and of good quality. The local market for canned milk is therefore very limited. It is stocked by stores throughout the country, however, and a certain class of household prefers canned milk. There is also a considerable consumption of canned milk during the rush season in tourist centres where the fresh milk supply is limited.

The volume of Swiss export trade in canned milk is shown by the following table:—

Swiss Canned Milk Exports.

Year.	Short Tons.	Value (Dollars).
1913	44,614	8,520,600
1922	22,690	5,558,330
1923	27,855	6,161,139
1924	29,051	6,899,557
1925	33,707	7,881,086
1926	36,893	7,896,543
1927	40,533	8,544,900
1928 (6 months) ..	19,195	4,137,656

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

Green Manures.

If a cover crop of leguminous plants is required for green manuring a start at planting may now be made. This can be done only when all the fruit has been gathered from the trees. An early crop is a distinct advantage. The cover crop should make a good growth before the winter sets in, as the plants make very little headway in the cold weather, and they require to be ploughed in as soon as the ground is dry enough in early spring. It will thus be seen that it is necessary to get a good autumn growth, as dense as possible, and one which will adequately cover the surface before winter.

Cultivation.

Should the weather remain hot and dry it will be very necessary to give the land surface a good stirring, so as to conserve water supplies. Where fruit crops have been gathered a start may be made late in the month with the autumn ploughing; whatever ploughing is done should be left as rough as possible.

Pests.

No codlin moth-affected or diseased fruit of any kind should be left on the ground after the crop has been gathered. These should all be destroyed by boiling.

All rust-affected foliage and fruit of plum and peach trees, as well as all other stone fruits that have been attacked by this and other fungus diseases, such as shot-hole, &c., should be burned if possible. This will minimize the possibility of future attacks.

The Vegetable Garden.

Autumn weeds must be kept out of the kitchen garden. These rapidly grow, and remain as robbers right through until the spring time.

The section should be well dug over for planting winter crops. Before digging a light sprinkling of bonedust and a good top dressing of stable manure should be spread on the surface. These may then be dug in, as they provide humus for the soil. Large plots should be avoided in winter; where such occur a path should be run down the centre. This will provide more efficient drainage. The beds, too, may be more raised than in the summer time.

Early onions may be planted out in the beds, and, if not already done, onion seed should be planted at once.

All classes of seedlings may be planted out, and seeds of lettuce, early peas, beet, carrots, radish, cabbage, cauliflower, and swede turnip may be sown.

Asparagus beds should be cleaned up and cut down as soon as the berries begin to colour. Celery rows should be kept earthed up rhubarb beds should be given a dressing of manure to encourage the coming winter crop, and new rhubarb plantations may now be established.

The Flower Garden.

All classes of spring-flowering bulbs may now be planted. In bulb planting the bulbs should not come in contact with any manure. The manure should, some time previously, have been dug well in, and mixed with the soil, and all heat should have disappeared. If manure is required it should be placed below the bulb, so that the roots may ultimately penetrate to it. Bulbs thrive in sandy soils, and where the soil is heavy a little sand may be added to advantage. Bulbs should not be planted too deeply; the depth to plant is generally regulated by the size of the bulb. Such bulbs as freesias may be covered with only an inch of soil, while larger bulbs may be somewhat deeper.

The increasing prevalence of both bulb mite and rhizoctinia fungus in attacking bulbs makes it a matter of urgency that all bulb gardens and plots should be well dressed with lime before the bulbs are planted. The lime should be dug into the soil; and after the bulbs have been planted, a top-dressing should also be given. Each dressing need not exceed 2 ozs. per square yard. Clifts's manurial insecticide is also good.

Dahlias and chrysanthemums may be fed with liquid manure, or mulched with stable or poultry manure. In any case the feeding should not be too strong nor too frequent, and it should always be withheld before the flowers come.

All hardy annual, biennial, and perennial seeds may now be planted. Among these are dianthus, candytuft, sweet peas, Iceland poppies, anemone, ranunculus, stock, wallflower, columbine, foxglove, phlox, penstemon, pansy, gaillardia, &c.

Wherever aphis and red spider occur the plants should be sprayed with benzole emulsion, nicotine, pestend, or soaperine, or some other preventive in order to protect the coming flowers. Mildew attacks on the rose should be warded off by the use of sulphur. The sulphur may be either dusted on the plant or it may be scattered on the ground around and under the plant.

March is one of the best months for transplanting evergreen plants of all classes, trees, shrubs, and palms. The roots of the transplanted plants should be disturbed as little as possible, while the roots of those transplanted from pots should be well uncoiled and set out before planting.

The soil is now warm, and the roots will quickly take hold and grow. They are thus established for the winter, and will give little or no trouble in the subsequent summer heat and dryness.

In preparing the soil for planting the trees care should be taken not to dig small holes. A small hole is simply a "pot hole," in which the winter water accumulates, and as a result the young tree roots are rotted.

A large hole should be dug; or better still, the whole planting area should be well cultivated all over, and the plants or trees then set out in this cultivated area.

REMINDERS FOR APRIL.

LIVE STOCK.

Horses.—Those stabled should be fed liberally. Food of a more stimulating nature can now be given to get them well over the "changing coat" season. Those doing fast or heavy work should be clipped; if not wholly, then trace high. The legs should not be clipped. Those not rugged on coming into the stable at night sweating freely should be wiped down and in half-an-hour's time rugged or covered with bags until the coat is dry. Yearling colts if vigorous and well grown may be castrated. Weaned foals should have a little crushed oats daily, if available. Horses to be turned out during winter should not be clipped. Their mouths and feet should be examined and attended to where necessary.

Cattle.—If new grass is plentiful, give a ration of hay to counteract its scouring effect. If yields should be falling owing to diminishing food supply, supplement the grazing by hand to stay the fall in yield till adequate paddock food again becomes available. Where the individual yield justifies it, don't

hesitate to give a few pounds of, say, bran, pollard, crushed oats, polly feed, linseed meal, &c. (mixed or separate), rather than let the yield unduly fall. If advantage were taken of the February rain, young Algerian oats may now be available for grazing or soiling. When an oat crop once becomes well stooled it may be grazed, and should then be kept down below 9 inches high. If soil is too wet or "puggy" to permit the stock in the crop, it may be cut and thrown over the fence to them. Don't delay longer in sowing the main oat crop for conversion to either ensilage or hay in late November or early December. The maize crop should be got into the silo before the frosts come. This may be done as soon as the ripening process is making it daily drier instead of greener. As cows calving in the summer months are at a disadvantage, keep them away from the bull until July. (This, of course, excepts shy breeders and cows especially wanted to maintain a city milk supply.) Keep the young stock growing with a bit of crushed oats or a legume hay (lucerne, clover, or cow grass), either as a supplement to skim milk or without. Keep the chain-harrow going on occasion to scatter the cow-droppings. Every available bit of animal manure should go into the ground now before the cold of winter checks the activity of the soil micro-organisms.

Pigs.—Sows not already served should be put to the boar. Supply all pigs with plenty of bedding, and see that sties are warm and well ventilated during cold weather. Give sows access to pasture. This will reduce the cost of feeding larger—better litters will be the result. Castrate young boars as early as possible. Pigs should be highly profitable now, as pork is very dear. Rape barley (especially skinless), oats, &c., may be sown for grazing during winter. There is a great shortage of high-class bacon suitable for Wiltshire sides. This must be rectified by breeding on better lines and feeding properly. It is proved that first cross pigs, the progeny of two pure breeds, produce better bacon and more cheaply than subsequent crosses, so it should be the aim of all to work into pure sows as rapidly as possible, and by using the Large York boar on pure-bred sows, Middle York or Berkshire for preference, the class of pigs will more nearly approach the requirements of the curers.

Poultry.—Soft food aids moult; add a teaspoonful of linseed to each bird's ration once daily. The more exercise the hens get the better they moult. The mash is mixed with one packet of Epsom salts to twenty birds once a week. Keep a sharp look out for chicken pox. Forward pullets should now be in their winter quarters, with plenty of scratching litter, and fed liberally—including ration of animal food, dried milk, or separated milk. Grit, shell, and charcoal should always be available. Feed some succulent green food after the grain food at night.

Sheep.—Merino and fine cross-bred ewes, if mated early (November-December), will lamb from now on. Particularly will this apply to early shorn ewes joined in the north of the State, as they have a natural tendency to take the rams early. These fine-woolled ewes, if in lamb to a Lincoln, Romney Marsh, Shropshire, Dorset Horn, English and Border Leicester, or Suffolk, may have trouble at lambing. Close attention should be given early morning and evening during the lambing period, with a view to avoiding losses in both ewes and lambs; if trouble is experienced, attention should be given at midday also. Heavy-woolled ewes cast easily, and need constant attention. Crutching is usually undertaken this month, and a safe rule to follow is to have all ewes that are to lamb crutched one month before lambing. Lambing is usual (considering the varied conditions of the different districts of this State) from March to September, but flock owners should arrange their lamb-dropping date to suit their particular country. True, they have no control over the season, but they would be wise to strike an average, considering the question of feed and water. If ewes are attentive mothers, and the flock owner has given them all reasonable practical attention, any lambs that die will not be a great loss, as they would be probably poor culls if saved by more expensive treatment and cost. Foxes, eagle hawks, and stray dogs are often the cause of losses at lambings and should be guarded against where possible. Give purgative drenches at first sight, if ewes appear ill in any way. Ewes after difficult parturition or retention of after-birth can often be saved by flushing out

with ½ oz. of lysol to 3 parts of warm water. Fresh pasture, sown grasses, or green crops should be reserved for ewes with their lambs a few days after lambing. Marking of the lambs can be undertaken one week after birth, but it is usual to wait for about two or three weeks after the first lambs are dropped before having a general marking. A second marking at about six weeks usually completes the operations in this direction for the flock. In marking sheep cleanliness is essential, and it is wise to erect yards for the purpose in the paddock, instead of using old sheep-yards where disease may lurk in the dust, &c. In districts where conditions make a second dipping necessary, see that it is done before the weather becomes too unsettled, and certainly in the case of lambing ewes, well before or after lambing.

CULTIVATION.

Farm.—Dig potatoes as they mature. Cart out and spread stable manure. Finish preparation of land for main cereal crops. Sow Chou Moellier seed in beds for transplanting. Sow a mixture per acre for green feed during the winter months for the dairy herd, such as:—1½ bushels, Oats; ½ bushel, Cape Barley; ½ bushel, Tick Beans; ½ bushel, Peas. Sow Giant Drumhead Cabbage for transplanting (1 lb. sufficient for 1 acre, in rows 3 feet apart); provided the soil is in good friable condition, plants from seed sown last month should be planted out. Early sowings of wheat and oats begin; also rape for winter feed or green manuring. Prepare clean seed-bed for lucerne; and sow Hunter River, Arabian, or Peruvian seed, free from dodder, in drills 7 inches apart and at the rate of 12 lb. of seed per acre. Sow permanent pastures with grasses and clovers.

Orchard.—Prepare land for planting; plough deeply and sub-soil. Plant legumes for green manure. Plant out strawberries. Clean up Codlin Moth from trees as soon as all fruit is gathered.

Flower Garden.—Plant out evergreen shrubs, trees, and Australian plants, divisions of herbaceous plants, sedlings, layers, and rooted cuttings. Feed chrysanthemums with liquid manure weekly until flowers begin to open. Prepare land for future plantings of roses and shrubs. Keep dahlias tied to stakes.

Vegetable Garden.—Plant out seedlings from the seed beds. Dig all vacant spaces roughly. Sow onions for early crop; also peas and broad beans. Clean out asparagus beds wherever the seeds are ripening.

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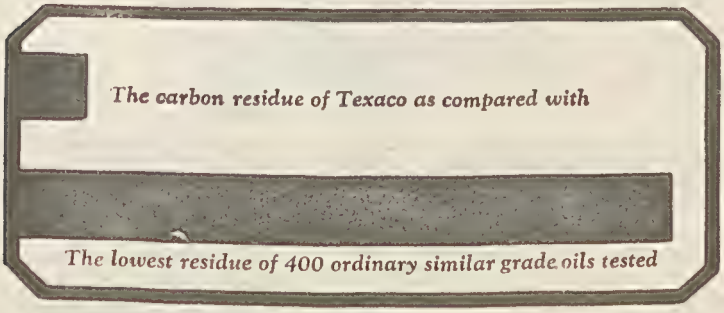

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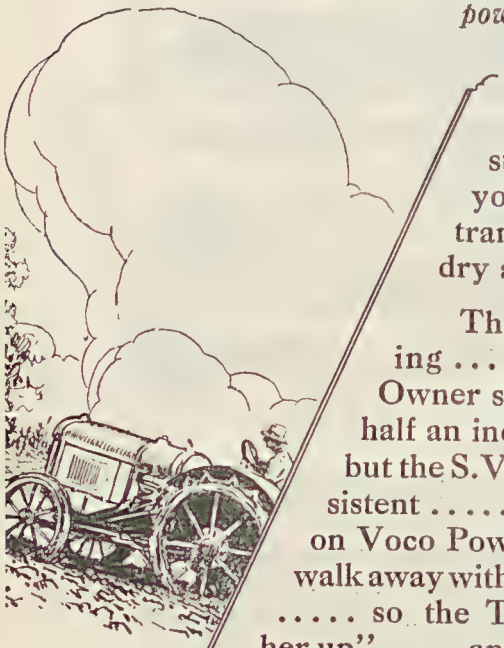

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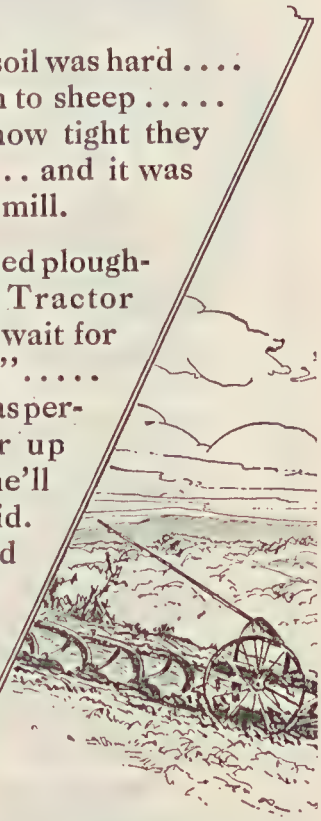

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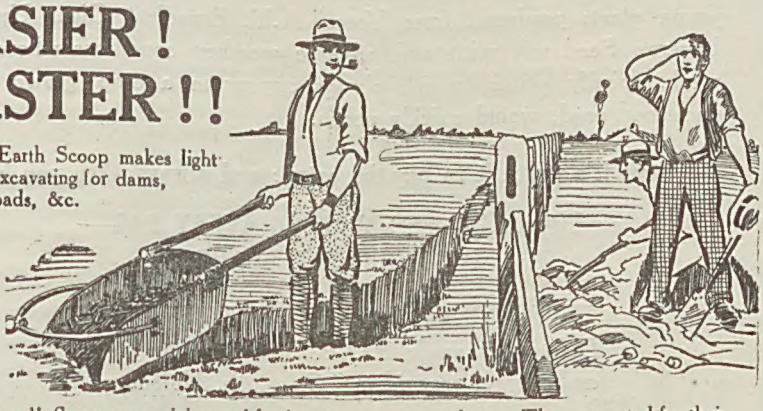

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